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IN THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA

INTERNATIONAL BUSINESS MACHINES CORPORATION, a New York Corporation, Plaintiff, v. ZILLOW GROUP, INC., a Washington Corporation, ZILLOW, INC., a Washington Corporation, Defendants.	Case No. 8:19-CV-01777 **FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT** **JURY TRIAL DEMANDED**

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff International Business Machines Corporation ("IBM"), for its Complaint for Patent Infringement against Zillow Group, Inc. ("Zillow Group") and Zillow, Inc. (collectively "Defendants" or "Zillow"), alleges as follows:

JURISDICTION AND VENUE

1.   This action arises under 35 U.S.C. § 271 for Defendants' infringement of IBM's United States Patent Nos. 7,072,849 (the "'849 patent"), 7,076,443 (the "'443 patent"), 7,187,389 (the "'389 patent"), 7,631,346 (the "'346 patent"), 8,315,904 (the

1   "'904 patent"), 9,158,789 (the "'789 patent"), and 9,245,183 (the "'183 patent")

2   (collectively, the "Patents-in-Suit").

3   2.   This action arises under the patent laws of the United States, including 35

4   U.S.C. § 271 *et seq.* The jurisdiction of this Court over the subject matter of this action

5   is proper under 28 U.S.C. §§ 1331 and 1338(a).

6   3.   This Court has personal jurisdiction over Zillow Group and Zillow, Inc.

7   because, among other things: Zillow Group and Zillow, Inc. have a regular and

8   established place of business in this judicial district; Zillow Group and Zillow, Inc. have

9   committed, aided, abetted, contributed to and/or participated in the commission of acts

10   giving rise to this action within the State of California and this judicial district and have

11   established minimum contacts within the forum such that the exercise of jurisdiction

12   over Zillow Group and Zillow, Inc. would not offend traditional notions of fair play and

13   substantial justice; Zillow Group and Zillow, Inc. have placed products and services

14   that practice the claims of the Patents-in-Suit into the stream of commerce with the

15   reasonable expectation and/or knowledge that actual or potential users of such products

16   and/or services were located within this judicial district; and Zillow Group and Zillow,

17   Inc. have sold, advertised, solicited customers, marketed and distributed their services

18   that practice the claims of the Patents-in-Suit in this judicial district.
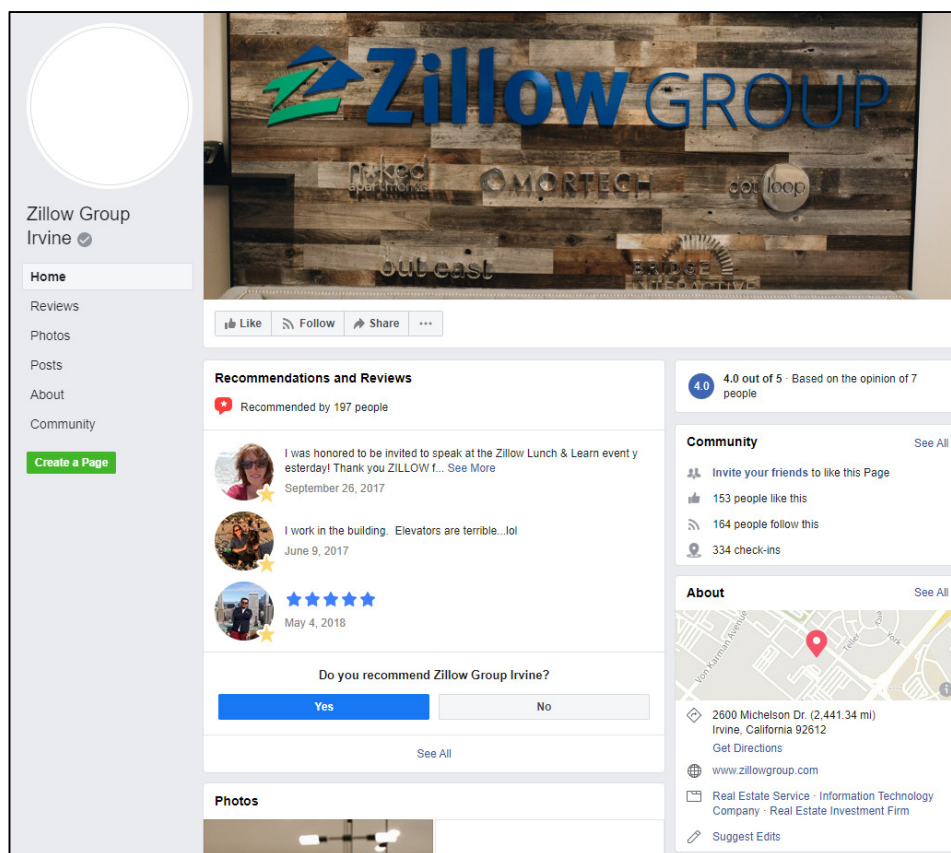
19   4.   Venue is proper in this Court pursuant to 28 U.S.C. §§ 1391(b) and (c) and

20   1400(b), at least because Zillow Group and Zillow, Inc. each have a regular and

21   established place of business in this judicial district and both Zillow Group and Zillow,

22   Inc. have committed, and continue to commit, acts of infringement in this judicial

23   district.

24   **A.   Zillow Has A Regular And Established Place Of Business In This District.**

25   5.   Zillow Group and Zillow, Inc. have a regular and established place of

26   business in this judicial district at 2600 Michelson Drive, Suite 1200, Irvine, CA 92612.

27   The building at 2600 Michelson Drive is marked with Zillow Group's name and logo:

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11   Ex. 1 (https://www.loopnet.com/Listing/2600-Michelson-Dr-Irvine-CA/14368559/).

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26   Ex. 2 (https://www.facebook.com/pages/category/Real-Estate-Service/Zillow-
27   Group-Irvine-132635443939887/).
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FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT   3   Case No. 8:19-CV-01777

1 The building is also home to Zillow, Inc.[1] Zillow Group and Zillow, Inc. have

2 approximately 60,074 square feet of office space in Irvine, California.[2]

3   6.   Venue is also proper in this district because Zillow Group and Zillow, Inc.

4 have numerous employees in this judicial district who are responsible for the design,

5 operation, sale, and marketing of the accused website and mobile applications. Zillow

6 Group and Zillow, Inc.'s technical employees in the district have titles such as: Senior

7 UI Designer, Senior Software Engineer, Software Engineer, Director of Product

8 Development, Full Stack JavaScript Engineer, Senior Software Developer, DevOps

9 Engineer, UI/UX Designer, QA Engineer, Senior Group Manager—Big Data, Senior

10 Software Development Manager, Software Development Engineer, and Product

11 Manager. Zillow Group and Zillow, Inc.'s technical employees design, develop, and

12 implement the infringing functionalities of the accused website and mobile applications

13 in Irvine, California. Zillow Group and Zillow, Inc.'s technical employees in this

14 district also have relevant information related to the design, development, and operation

15 of the accused website and mobile applications.

16   7.   In addition to the employees already present in the district, Zillow Group

17 and Zillow, Inc. continue to advertise available job postings in the area, including for

18 the following positions: Senior Principal Machine Learning Engineer—Search,

19 Principal Machine Learning Engineer—Conversational AI, Data Integration Specialist,

20 Senior Front End Engineer, and Senior Software Development Engineer for New

21 Construction Listings.

22   8.   Zillow Group and Zillow, Inc. also have sales and marketing employees

23 who work in the judicial district with titles such as: Sales, Sales Executive, Inside Sales,

24 Senior Account Manager, Agent Care Consultant, and Regional Sales Executive.

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26 [1] Ex. 3 (http://zillowgroup.mediaroom.com/2012-04-16-Zillow-to-Open-New-Office-
Grow-Sales-Force-In-Orange-County-Calif) (describing 600 Michelson Drive, Irvine,

27 CA 92612 as a Zillow office location).

28 [2] Ex. 4 (Zillow Group 2018 10-K) at 38.

1 Zillow Group and Zillow, Inc.'s sales and marketing employees located in Irvine, CA

2 are responsible for the sale and marketing of the infringing functionalities of the accused

3 website and mobile applications.[3]   Zillow's Irvine, CA office also includes sales

4 personnel responsible for work related to Zillow Premier Agent and, in particular,

5 "advertising to real estate agents."[4]   Zillow Group and Zillow, Inc.'s sales and

6 marketing employees in the district therefore have relevant information related to

7 demand for the infringing functionality, the marketing of the accused website and

8 mobile applications, and the revenue, costs, and profits of the accused website and

9 mobile applications.

10   9.   On information and belief, Zillow Group and Zillow, Inc. offer networking

11 and support services from its offices located in the district. For example, Zillow

12 develops and offers its customer services from its office in Irvine, CA.[5]

13   10.   Venue is also proper in this district because Zillow Group and Zillow, Inc.

14 own numerous properties that they have purchased through "Zillow Offers."   For

15 example, Zillow Group and Zillow, Inc. have made "Zillow Offers" available in at least

16 Los Angeles County,[6] Orange County,[7] and Riverside County.[8] As part of "Zillow

17 Offers," Zillow Group and Zillow, Inc. purchase homes directly from home owners,

18 make repairs, and then sell the homes.[9] For example, Zillow Group and Zillow, Inc.

19 own the properties at 2526 N Whitewater Club Dr., Unit B, Palm Springs, CA 92262

20 and 101 Englemann Dr., Corona, CA 92881 in Riverside County.

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23 [3] *Id.* at 14.
    [4] Dkt 34-2 (Declaration of Nate Moch ("Moch Decl.")) ¶ 15.

24 [5] *Id.* ¶ 11.
    [6] Ex. 5 (https://www.latimes.com/business/la-fi-zillow-home-buying-20181211-

25 story.html).
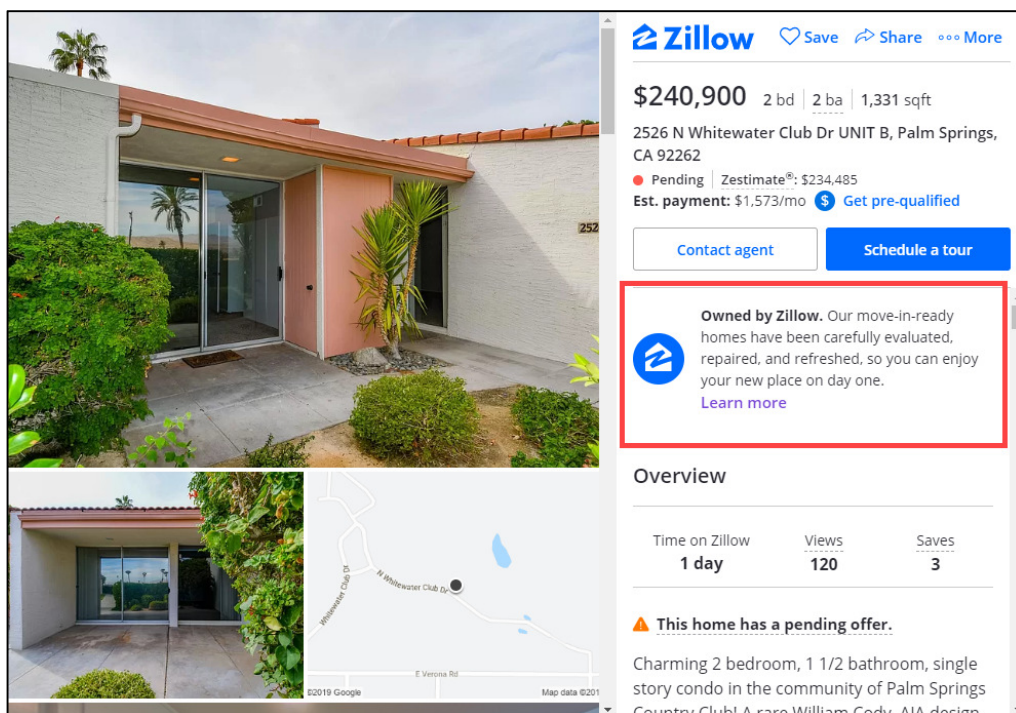
26 [7] Ex. 6 (https://www.ocregister.com/2019/05/09/zillow-offers-announces-plans-to-
    expand-ibuying-in-l-a-orange-counties/).

27 [8] Ex. 5.
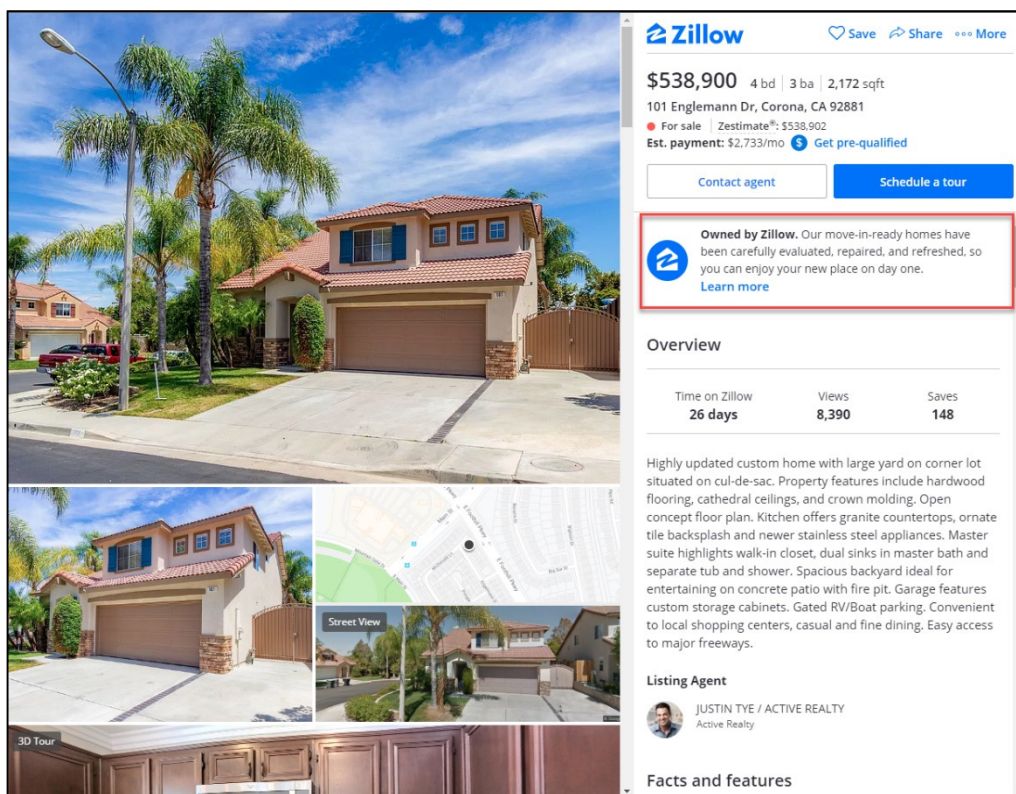
28 [9] Ex. 7 (https://www.zillow.com/offers/) (describing the process for selling a home to
    Zillow Group and Zillow).

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT   5   Case No. 8:19-CV-01777

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Ex. 8 (https://www.zillow.com/homedetails/2526-N-Whitewater-Club-Dr-UNIT-B-
Palm-Springs-CA-92262/82017038_zpid/).

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1   Ex. 9 (https://www.zillow.com/homes/101-Englemann-Dr-Corona,-CA,-

2   92881_rb/54952838_zpid/).

3   These properties also constitute regular and established places of business in this

4   judicial district.

5   **B.   Zillow Develops The Infringing Products And Services In This District.**

6   11.   Zillow Group and Zillow, Inc.'s numerous technical employees in Irvine,

7   CA develop aspects of the infringing website and mobile applications in this district.

8   Zillow Group and Zillow, Inc. have numerous employees in the judicial district who are

9   responsible for the design, and operation of the accused website and mobile

10   applications, including the following employees: Senior UI Designer, Senior Software

11   Engineer, Software Engineer, Director of Product Development, Full Stack JavaScript

12   Engineer, Senior Software Developer, DevOps Engineer, UI/UX Designer, QA

13   Engineer, Senior Group Manager—Big Data, Senior Software Development Manager,

14   Software Development Engineer, and Product Manager. Further, members of the teams

15   that develop Zillow's website and mobile applications, such as members of Zillow's

16   "artificial intelligence ('AI') team," which is one of the "teams and personnel []

17   responsible for any potentially relevant Zillow technology"[10] in this case, are located in

18   this judicial district. For example, Andrei Lopatenko, who is Zillow's Vice President

19   of "Engineering, Search and Conversational AI, AI, Machine learning," and a member

20   of the AI team, posted a job opening for said AI team for Zillow's Irvine office, seeking

21   engineers that "are experienced in and interested to build [] modern query understanding

22   and search ranking stacks [] based on machine learning."[11] For another example, Andrei

23   Lopatenko posted another job opening stating that "[t]he search team of Zillow Group"

24   is hiring "SR MLE, SR Principal, and Principal roles" to work on "Natural Language

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27   [10] Moch Decl. ¶ 3.

28   [11] Ex. 10 (https://www.linkedin.com/in/lopatenko/detail/recent-activity/shares/).

Processing, Conversational AI and Learning to Rank" in their Irvine office.[12] The hired

employees would "actively work[] on query understanding, ranking and conversational

platforms and their business applications."[13]

12.   Further, additional Zillow employees that develop and provide the website

and mobile applications are located in this judicial district. For example, Boaz Brudner

is a Senior Group Manager—Big Data in Zillow's Irvine, CA office, and he "[l]ead[s]

a group of application developers and data engineers to power Zillow's public data

feed. This feed drives some of Zillow's foundational features such as ***Zestimate and

the Home Details Page***."[14] The "Home Details team" is a part of the "front-end Web

Shopping team," which in turn is "involved in the development and maintenance of its

consumer-facing website"[15] and thus is responsible for infringing Zillow technology in

this case. Zillow's "generation of 'Zestimates'" is also "relevant to Zillow's alleged

infringement of the '183 patent."[16] For another example, Michael (Shinbo) Wang is

Senior Software Development Manager in Zillow's Irvine, CA office and "[m]anag[es]

nationwide real-time MLS (Multiple Listing Service) listing intake and downstream

web APIs that power listing data for Zillow.com."[17] For another example, David

Stewart is a Software Development Engineer in Zillow's Irvine, CA office, where he

"work[s] on the back end of Zillow's data services to bring the most accurate and up-

to-date listing information to the Zillow Group."[18] For another example, Sravya Kotte

is a Product Manager in Zillow's Irvine, CA office that works on, among other things,

"B2C mobile friendly websites across Zillow, Trulia, and StreetEasy brands."[19] On

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[12] Ex. 69 (https://www.linkedin.com/posts/lopatenko_the-search-team-of-zillow-group-started-hiring-activity-6605266210500202496-7Ced).

[13] *Id.*

[14] Ex. 11 (https://www.linkedin.com/in/boazbrudner/).

[15] Moch Decl. ¶ 3.

[16] *Id.* ¶ 7.

[17] Ex. 12 (https://www.linkedin.com/in/shinbowang/).

[18] Ex. 13 (https://www.linkedin.com/in/davidleestewartjr/).

[19] Ex. 14 (https://www.linkedin.com/in/sravyakotte/).

1 information and belief, "B2C" refers to "Business-to-Consumer," or the consumer-

2 facing website and mobile applications. For another example, Gideon Williams is a

3 Software Engineer in Zillow's Irvine, CA office, where he, on information and belief,

4 works on and is responsible for at least two GitHub source code repositories that relate

5 to the consumer-facing Zillow website and mobile applications, including the infringing

6 aspects of the consumer-facing Zillow website and mobile applications:

7 ZillowHomeInfo, which is a "[s]imple web app to display info about a home from the

8 Zillow GetSearchResult API" and ChatMagic, which is "[a] Zillow HackWeek project

9 to integrate a chatbot into the Real Estate App that answers questions for Beths and

10 routes highly-qualified leads to Premier Agent Concierge."[20]

11   13.   Zillow's technical job postings in this judicial district also show that Zillow

12 Group and Zillow, Inc. develop and provide the website and mobile applications in this

13 judicial district. For example, the "artificial intelligence ('AI') team" is one of the

14 "teams and personnel [] responsible for any potentially relevant Zillow technology" in

15 this case.[21] One of the technical engineers Zillow is hiring for employment in its Irvine,

16 CA office, Zillow's Principal Machine Learning Engineer—Conversational AI, is a

17 "part of the overall Artificial Intelligence team"[22] that is, in part, responsible for

18 infringing Zillow technology in this case. For another example, another of the technical

19 engineers Zillow is hiring, Senior Principal Machine Learning Engineer—Search, will

20 work in Zillow's Irvine, CA office on "develop[ing] semantic and conversational search

21 which can process natural language queries about real estate and assist users to find the

22 best properties for their needs."[23] On information and belief, the "semantic and

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24 [20] Ex. 15 (https://www.linkedin.com/in/gideon-williams-833b2415/); Ex. 16
    (https://github.com/gideonw/ZillowHomeInfo); Ex. 17

25 (https://github.com/gideonw/ChatMagic).

26 [21] Moch Decl. ¶ 3.

    [22] Ex. 18 (https://careers.zillowgroup.com/ShowJob/JobId/262121/PrincipalMachine
27 LearningEngineer ConversationalAI).

28 [23] Ex. 19 (https://careers.zillowgroup.com/ShowJob/JobId/337832/SeniorPrincipal
    MachineLearningEngineerSearch).

1   conversational search which can process natural language queries about real estate and

2   assist users to find the best properties for their needs" is relevant to Zillow's

3   infringement of at least claim 1 of the '443 patent.

4   14.   Further, many Zillow employees that develop and provide additional

5   aspects of Zillow's website and mobile applications, including "Business-to-Business"

6   (or "B2B"), are located in this judicial district, such as: services providing advertising

7   (including on its consumer website and mobile applications), including advertising of

8   new construction, advertising from Zillow Group Media, and advertising from

9   www.zillow.com/advertise; Premier Agent; and Zillow Offers. For example, Zillow

10 develops the technology for its "business-to-business" tools in its Irvine, CA office.[24]

11 Zillow also employs a "Software Development Engineer" in Irvine, CA that "works on

12 B2B features."[25] Zillow also develops the technology "to manage the process of directly

13 offering to sell homes that Zillow itself owns" as a part of Zillow Offers in its Irvine,

14 CA office.[26] Zillow employees in its Irvine, CA office also "manage Zillow's intake of

15 'for sale' listing and 'county direct' data feeds."[27]

16   15.   Zillow Group and Zillow, Inc. also develop the infringing products and

17 services in this district during their "Hack Weeks," which are held multiple times a year

18 and take place in, among other places, Zillow's Irvine, CA office.[28] During the "Hack

19 Weeks," multiple Zillow engineers work on projects to improve the Zillow website and

20 mobile applications, including customer-facing aspects of the website and mobile

21 applications that affect the user experience of Zillow's customers.[29] The Hack Week

22 projects include the development of portions of the Zillow website and mobile

23 applications that infringe the Patents-in-Suit, as shown below.
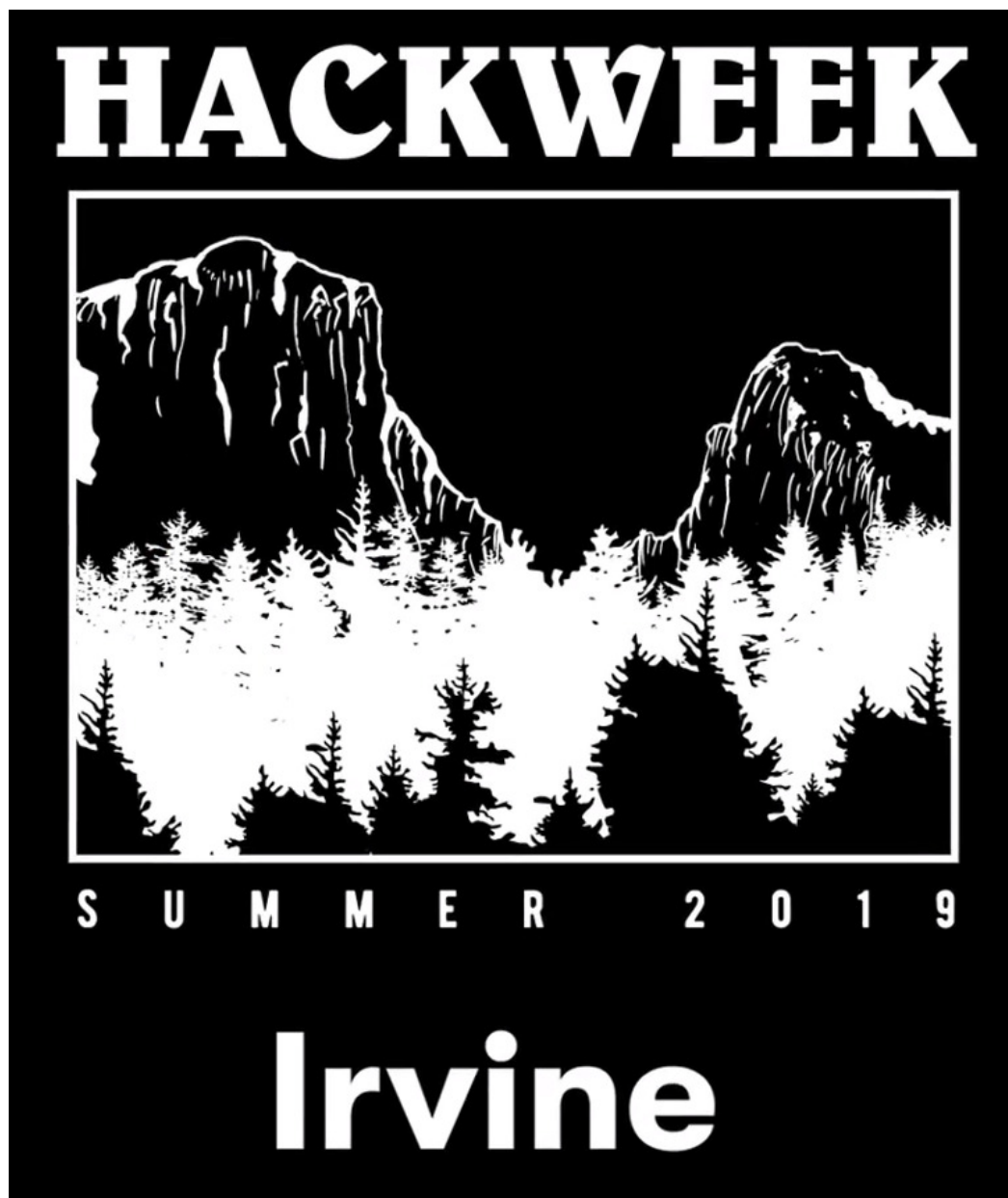
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25 [24] Moch Decl. ¶ 11.

26 [25] *Id.* ¶ 13.

27 [26] *Id.* ¶ 11.
    [27] *Id.*

28 [28] Ex. 20 (https://www.zillow.com/tech/zillow-hack-week-summer-2019/).
    [29] *Id.*

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Ex. 70 (screenshot of video from https://www.zillow.com/tech/zillow-hack-week-summer-2019/ at 00:34).

Spencer Rascoff is at Zillow Group Irvine.

Hack Week is one of my favorite events at Zillow Group, and today's event in the Irvine office was great as usual. It's always inspiring to hear innovative ideas that not only help improve our customer experience but also foster our #MoveFastThinkBig and #ZGIsATeamSport spirit. We have Hack Weeks every few months, when people are allowed to work on whatever inspires them. It's fun to see people experiment with new technologies, build new software tools to make us more efficient, and innovate for our consumers and business partners.

After the Hack Week demos today, I met with the Bridge Interactive team (Zillow Group's broker and MLS software provider) to learn about the strides they're making toward supporting our overall mission of building the largest, most trusted and vibrant home-related marketplace in the world.

Today was another day of learning, and I'm proud of all the efforts so many ZG teams make every day to make us better and smarter. #zglife

October 24, 2017 at 12:04 AM · Irvine, CA · Public

Ex. 21 (https://www.facebook.com/SpencerRascoff/posts/hack-week-is-one-of-my-favorite-events-at-zillow-group-and-todays-event-in-the-i/1955824484676939/).

16.   Moreover, on information and belief, Zillow Group and Zillow, Inc. store, or have electronic access to, numerous documents related to the design, development, operation, sale, and marketing of the accused website and mobile applications in this district. Zillow Group and Zillow, Inc. store these documents at their offices at 600 Michelson Drive, Suite 1200, Irvine, CA 92612 in order to support their employees located there. Further, on information and belief, Zillow Group and Zillow, Inc. have access in this district to substantially the same documents related to the design, development, operation, sale, and marketing of the accused website and mobile applications as they do in other Zillow locations in other judicial districts. In particular, on information and belief, Zillow Group and Zillow, Inc. have servers in this judicial district through which Zillow employees working in this district can access documents, including those related to the design, development, operation, sale, and marketing of

1 the accused website and mobile applications. Additionally, on information and belief,

2 Zillow Group and Zillow, Inc. have servers in this judicial district through which Zillow

3 employees working in this district can access source code and other computer code for

4 the accused products. For example, Gideon Williams is a Software Engineer in Zillow's

5 Irvine, CA office, where he, on information and belief, manages and accesses at least

6 two GitHub source code repositories that relate to the consumer-facing Zillow website

7 and mobile applications, including the infringing aspects of the consumer-facing Zillow

8 website and mobile applications: ZillowHomeInfo, which is a "[s]imple web app to

9 display info about a home from the Zillow GetSearchResult API" and ChatMagic,

10 which is "[a] Zillow HackWeek project to integrate a chatbot into the Real Estate App

11 that answers questions for Beths and routes highly-qualified leads to Premier Agent

12 Concierge."[30] Finally, on information and belief, Zillow Group and Zillow, Inc. have

13 servers in this judicial district through which Zillow employees working in this district

14 can manage and determine at least network settings for the accused products.

15 **C.   Zillow Infringes Through Its Own Actions In This District.**

16 17.   Zillow Group and Zillow, Inc. commit (directly and indirectly) acts of

17 infringement in this judicial district. Zillow Group and Zillow, Inc. directly infringe the

18 Patents-in-Suit in this judicial district by providing Zillow's website, including at least

19 www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and mobile

20 applications, including at least iOS and Android Zillow Real Estate & Rentals, Zillow

21 Rentals, and Zillow Premier Agent applications, from their offices in this judicial

22 district to end users, businesses, and consumers also located in this judicial district. In

23 particular, Zillow Group and Zillow, Inc. provide Zillow's website and mobile

24 applications from their offices in this judicial district by developing the website and

25 mobile applications at least in part in their Irvine, CA office and transmitting, or

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27 [30] Ex. 15 (https://www.linkedin.com/in/gideon-williams-833b2415/); Ex. 16

28 (https://github.com/gideonw/ZillowHomeInfo); Ex. 17 (https://github.com/gideonw/
ChatMagic).

1   controlling the transmission of, the content of the website and mobile applications at

2   least in part from their Irvine, CA office.

3   18.   Further, Zillow Group and Zillow, Inc. directly infringe the Patents-in-Suit

4   in this judicial district by providing Zillow's website and mobile applications to end

5   users and consumers located in this judicial district. A substantial number of users

6   access Zillow's website and mobile applications from this judicial district, and Zillow

7   infringes in this district through that access. On information and belief, more users

8   access Zillow's website and mobile applications from this judicial district than from the

9   Western District of Washington. Additionally, Zillow receives significant revenue from

10   the use of Zillow's website and mobile applications in this judicial district.   On

11   information and belief, Zillow receives more revenue from the use of the accused

12   products in this district than in the Western District of Washington.

13   19.   Zillow Group and Zillow, Inc. also directly infringe in this judicial district

14   because, in some circumstances, they perform the patented methods on Zillow's mobile

15   applications on user devices in this district. As described in Counts One through Seven

16   below, Zillow Group and Zillow, Inc. perform the claimed methods using their mobile

17   applications. Zillow provides the mobile application computer code and performs

18   method steps of the Patents-in-Suit in this judicial district. As but one example, Zillow

19   performs the "selectively storing" step of claim 1 of the '849 patent at Zillow's servers

20   in some instances and at the user's mobile device in other circumstances.

21   20.   Zillow Group and Zillow, Inc. also directly infringe in this judicial district

22   by, on information and belief, using their website and mobile applications as end users

23   in their offices in this judicial district, in addition to also presenting the website and

24   mobile applications. For example, Zillow Group and Zillow, Inc. test their website and

25   mobile applications in their Irvine, CA office in this judicial district, as evidenced at

26   least by the regular Hack Weeks held in the Irvine office and by Zillow's employment

27   in this judicial district of a QA Engineer. In so testing their website and mobile

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1   applications, Zillow Group and Zillow, Inc. infringe in a similar manner to that

2   described in Counts One through Seven below.

3   21.   Zillow Group and Zillow, Inc. also directly infringe the Patents-in-Suit in

4   this judicial district, as shown in Counts One through Seven below, because, in some

5   circumstances, they perform at least some of the methods steps of the asserted claims

6   on Edge servers located in Los Angeles or on users' computers and devices, including

7   computer and devices within this judicial district, in addition to (or in the alternative to)

8   on Zillow's servers. For example, on information and belief, Zillow manages servers

9   in Los Angeles that host and serve content and functionality for the website and mobile

10 applications.[31]   As shown below, when www.zillow.com is requested, in some

11 circumstances, Zillow sends the requested content and functionally using the LAX3-C4

12 server, located in Los Angeles. On information and belief, Zillow does not host content

13 and functionality for the website and mobile applications, such as hosting and

14 distributing images, storing image objects, deploying and scaling web applications and

15 services, and managing image download requests, on servers, including cloud

16 infrastructure servers, located in Seattle or the Western District of Washington.[32]

17 Additionally, on information and belief, Zillow also does not host functionality for the

18 website and mobile applications, such as Zestimate and ZHVI calculation and public

19 data ingestion, and data storage, on servers, including cloud infrastructure servers,

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21 [31] Ex. 22 (https://aws.amazon.com/solutions/case-studies/zillow/) (explaining that
22 Zillow uses Amazon CloudFront as a Content Delivery Network (CDN)); Ex. 23
    (https://aws.amazon.com/about-aws/whats-new/2018/01/cloudfront-adds-six-new-
23 edge-locations/); Ex. 24 (https://aws.amazon.com/cloudfront/features/) (explaining
24 that Amazon CloudFront has Edge servers located in Los Angeles).
    [32] Ex. 22 (https://aws.amazon.com/solutions/case-studies/zillow/); Ex. 25
25 (https://www.zillow.com/tech/image-processing-in-aws/) (explaining that Zillow uses
    AWS services for image storage and processing); Ex. 26
26 (https://aws.amazon.com/about-aws/global-infrastructure/) (showing that AWS Global
27 Infrastructure is not located in Seattle or elsewhere within the Western District of
28 Washington).

located in Seattle or the Western District of Washington.[33] On information and belief, Zillow also does not host functionality for the website and mobile applications, such as storage of data used to create personalized recommendations, on servers, such as cloud infrastructure servers, located in Seattle or the Western District of Washington.[34] On information and belief, Zillow also does not host functionality for the website and mobile applications, such as its email delivery service alerting users of new listings on Zillow's consumer-facing website and mobile applications, on servers, such as cloud infrastructure servers, located in Seattle or the Western District of Washington.[35]

[33] Ex. 27 (https://d1.awsstatic.com/case-studies/PDF%20Case%20Studies/AWS-Casestudy_Zillow.pdf) (explaining that Zillow uses AWS services to store its data, ingest public data, and to calculate Zestimates); Ex. 26 (https://aws.amazon.com/about-aws/global-infrastructure/) (showing that AWS Global Infrastructure is not located in Seattle or elsewhere within the Western District of Washington); Ex. 67 (https://aws.amazon.com/partners/success/zillow-sparkpost/) ("It starts with [Zillow's] living database of more than 110 million U.S. homes—including homes for sale, homes for rent, and homes not currently on the market. It also provides Zestimate home values, Rent Zestimates, and other home-related information. To power these services, Zillow migrated from its original colocated data center to Amazon Web Services (AWS).").

[34] Ex. 68 (Screenshot of video from https://hostingjournalist.com/video/aws-reinvent-2016-zillow-classification-and-recommendation-engines-with-emr-and-spark-mac303/ at 24:00-14) (showing and explaining that all of the data that Zillow uses to make recommendations is hosted on AWS servers).

[35] Ex. 67 (https://aws.amazon.com/partners/success/zillow-sparkpost/) (describing the AWS technologies used to power Zillow's email infrastructure); Ex. 26 (https://aws.amazon.com/about-aws/global-infrastructure/) (showing that AWS Global Infrastructure is not located in Seattle or elsewhere within the Western District of Washington).
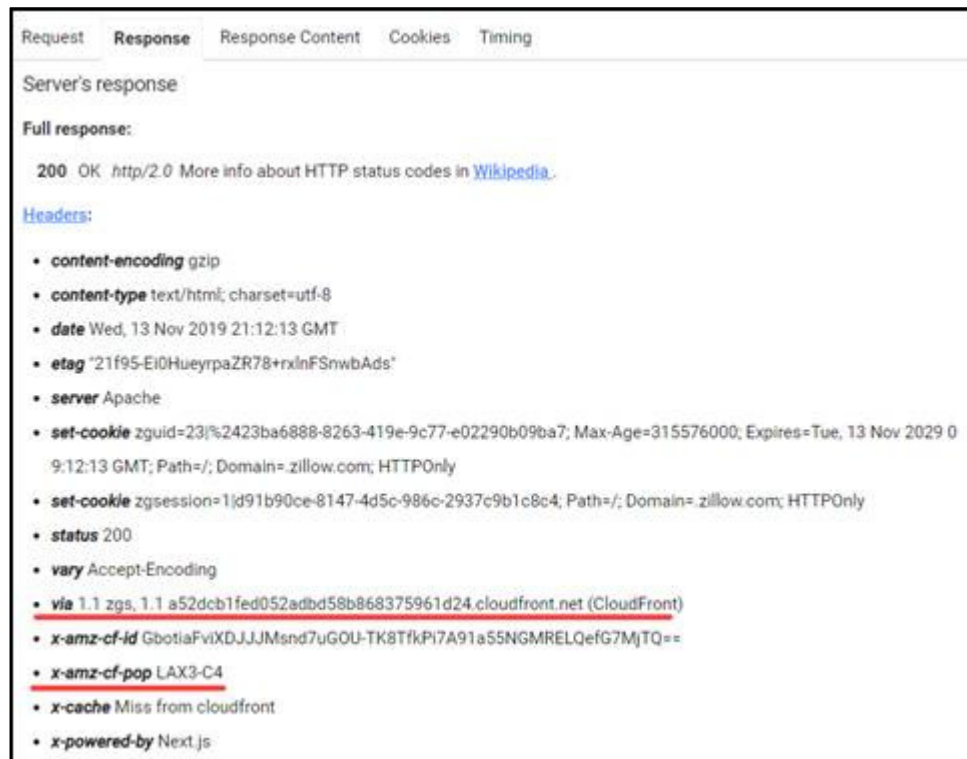
Ex. 28 (HTTP Request and Response for www.zillow.com from a browser

identified as being located in Los Angeles, CA from

https://toolbox.googleapps.com/apps/har_analyzer/).

Edge Location	IATA Code	City	Country	Last Update
LAX1	Los Angeles International Airport	Los Angeles, CA	United States	2019-05-10
LAX3-C1	Los Angeles International Airport	Los Angeles, CA	United States	2019-11-13
LAX3-C2	Los Angeles International Airport	Los Angeles, CA	United States	2019-11-13
LAX3-C3	Los Angeles International Airport	Los Angeles, CA	United States	2019-11-12
LAX3-C4	Los Angeles International Airport	Los Angeles, CA	United States	2019-11-13

Ex. 29 (https://www.feitsui.com/en/blog/page/3) (Amazon CloudFront edge server location codes).

D. Zillow Directs and Controls the Performance of Infringing Method Steps In This District.

22. In its briefing, Zillow has indicated that "at least one step [is] performed by a third party for at least the '849, '346, '789, '389, and '904 patents."[36] To the extent Zillow does not perform one or more method steps of the Patents-in-Suit in certain circumstances, including the "selectively storing" step of claim 1 of the '849 patent, Zillow directs or controls the performance of such method steps. As described in Counts One through Seven below, Zillow, Inc. and Zillow Group have an agency and/or contractual relationship with said third party in this judicial district and each Zillow entity controls and/or directs the performance of said third party by a number of means in this judicial district. For example, each Zillow entity controls and/or directs the performance of said steps by servers located in Los Angeles, as discussed above, because it, for example, conditions receipt of a benefit to the servers in Los Angeles, such as payment for services, on the performance of the claimed steps, and establishes the manner or timing of the performance by, for example, determining the actions of the servers, such as what content is delivered and how the content is delivered by and to the servers located in Los Angeles. For another example, each Zillow entity controls and/or directs the performance of said steps by users, browsers, and mobile operating systems located in Los Angeles, because it, for example, conditions receipt of a benefit to the users, browsers, and mobile operating systems, such as reduced latency on the

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[36] Dkt 34-1 (Ex. A to Zillow's Motion To Dismiss) at 8.

1   devices located in this judicial district, on the performance of the claimed steps, and

2   establishes the manner or timing of the performance by, for example, determining what

3   content is delivered, and how the content is delivered to users, browsers, and mobile

4   operating systems located in Los Angeles.

5   **E.   Zillow Infringes By Inducing Infringement In This District.**

6   23.   In addition to directly infringing the Patents-in-Suit, Zillow Group and

7   Zillow, Inc. indirectly infringe the Patents-in-Suit in this judicial district by inducing at

8   least users', browsers', and mobile operating systems' direct infringement, as described

9   in Count One and Counts Three through Seven below. As but one example, in addition

10 to Zillow's own direct infringement of claim 8 of the '789 patent, in certain instances,

11 users, browsers, and mobile operating systems directly infringe claim 8 of the '789

12 patent either by themselves or jointly, in this judicial district. As described below,

13 Zillow Group and Zillow, Inc. induce that infringement through acts of infringement

14 performed in this judicial district.

15   24.   Despite their knowledge of the infringement of the Patents-in-Suit, Zillow

16 Group and Zillow, Inc. have intended and continue to intend to induce patent

17 infringement in this judicial district by users, browsers, and mobile operating systems

18 located in this judicial district by advertising the website and mobile applications,

19 providing customer support, and designing their website and mobile applications in

20 such a way that the use of the website and mobile applications by a user, browser, or

21 mobile operating system infringes the Patents-in-Suit. For example, on information and

22 belief, Zillow advertises its website and mobile applications to users in this judicial

23 district, including using digital advertising.   For another example, Zillow has

24 encouraged and continues to encourage and instruct customers and end users to use

25 Zillow's website and the associated mobile applications in an infringing manner by

26 providing customer support from their Irvine office in this district, and designing their

27 website and mobile applications to be presented in this judicial district and in such a

28 way that the use of the website and mobile applications infringes the Patents-in-Suit.

1   For another example, "the technology developed in Zillow's Irvine office

2   concerns . . . customer service,"[37] including, on information and belief, customer

3   service to encourage and support customers and end users in their use of Zillow's

4   website and the associated mobile applications in an infringing manner. For another

5   example, https://zillow.zendesk.com/hc/en-us, which is available in this judicial

6   district, provides direction and support for Zillow's website. On information and belief,

7   Zillow Group and Zillow, Inc. also offer networking and support services from its

8   offices located in the district.

9   **F.   Zillow Infringes By Contributing To Infringement In This District.**

10   25.   In addition to directly infringing the Patents-in-Suit, Zillow Group and

11 Zillow, Inc. indirectly infringe the Patents-in-Suit in this judicial district by contributing

12 to at least users', browsers', and mobile operating systems' direct infringement, as

13 described in Count One and Counts Three through Seven below. As but one example,

14 in addition to Zillow's own direct infringement of claim 8 of the '789 patent, in certain

15 instances, users, browsers, and mobile operating systems directly infringe claim 8 of

16 the '789 patent either by themselves or jointly, in this judicial district. As described

17 below, Zillow Group and Zillow, Inc. contribute to that infringement through acts of

18 infringement performed in this judicial district.

19   26.   Despite their knowledge of the infringement of the Patents-in-Suit, Zillow

20 Group and Zillow, Inc. contribute to the infringement of the Patents-in-Suit in this

21 judicial district by selling, offering to sell, and/or importing components, and/or a

22 material or apparatus to this judicial district for use in practicing the patented methods

23 of the Patents-in-Suit. For example, Zillow Group and Zillow, Inc. provide computer

24 code underlying the Zillow website and mobile applications, such as HTML, JavaScript,

25 and image files, to customer and end users in this judicial district. Users, browsers,

26 and/or mobile operating systems infringe by using such website and/or mobile

27

28

[37] Moch Decl. ¶ 11.

1   applications, as detailed in Counts One through Seven below. As detailed above, Zillow

2   uses servers located in this judicial district to provide their computer code.

3   Additionally, Zillow's computer code, and Zillow's website and mobile applications in

4   general, is received and accessed in this judicial district. Further, on information and

5   belief, as a part of providing said computer code, Zillow Group and Zillow, Inc. enter

6   into binding contracts with end users and customers in this judicial district to use

7   Zillow's website and mobile applications, including in an infringing manner, such as

8   by binding the users to a terms of use for the accused website and mobile applications.

9   On information and belief, Zillow Group and Zillow, Inc. receive valuable

10   consideration from customers and end users located in this judicial district as a part of

11   such agreements, including information provided by customers and end users, and/or

12   information automatically collected from customers and end users. When customers

13   and end users in this judicial district use the accused website and/or mobile applications,

14   Zillow Group and Zillow, Inc. collect information about the customers and end users,

15   their devices, and their interaction with the accused website and the associated mobile

16   applications.   Zillow Group and Zillow, Inc. work with service providers and

17   advertising networks to track and manage cookie information and activities of

18   customers and end users located in this judicial district across different websites and

19   devices. Third parties use cookie information collected by Zillow Group and Zillow,

20   Inc. to deliver advertisements to end users and customers located in this judicial district

21   based on their use of the accused website and mobile applications. Zillow Group and

22   Zillow, Inc.'s business is funded in part through advertising. The applications and

23   website are especially made and/or especially adapted for use in infringing the Patents-

24   in-Suit, at least as detailed in the individual Counts below, and are not a staple article

25   or commodity of commerce suitable for substantial non-infringing uses because, among

26   other things, the components sent to users are uniquely designed only to access the

27   infringing aspects of Zillow's website and mobile applications.

28   **G.   IBM Has A Regular And Established Place Of Business In This District.**

1   27.   IBM has a regular and established place of business in the Central District

2 of California, located at 600 Anton Blvd., Costa Mesa, CA, 92626.[38] The Costa Mesa

3 office houses numerous employees. While many of these employees provide business

4 services, the IBM Costa Mesa office is also home to many engineers, working on

5 products ranging from artificial intelligence to content management and distributed file

6 sharing. Positions at IBM Costa Mesa include Head of AI Strategy & Offering at IBM

7 Content Services, Internet of Things ("IoT") Solutions Architect, and IBM

8 Distinguished Engineer. On August 15, 2018, IBM hosted an IBM Private

9 Cloud/Cognitive Computer Solutions presentation from its Costa Mesa, CA office.

Cognitive Computer Solutions is at IBM.

IBM Private Cloud solutions. We are always on the look out for the best solutions for our clients. Thank you to Beverly Beckwith for hosting the event at the IBM offices in Costa Mesa, CA. Thank you to Vito Roderaro for showing us the opportunities that are available for our clients. #cognitivecomputersolutions #ibmbusinesspartner

August 15, 2018 at 6:22 PM · Costa Mesa, CA · Public

Ex. 31

(https://www.facebook.com/permalink.php?id=140282896061823&story_fbid=18318 95610233868).

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[38] Ex. 30 (https://www.yellowpages.com/costa-mesa-ca/mip/ibm-30951397).

28.   IBM stores or can access numerous documents related to the Patents-in-Suit and to this litigation in the district. IBM has access to substantially the same documents related to the Patents-in-Suit and the instant litigation in this district as it does in other IBM offices in other judicial districts.

INTRODUCTION

29.   IBM is a world leader in technology and innovation. IBM spends billions of dollars each year on research and development, and those efforts have resulted in the issuance of more than 110,000 patents worldwide. Patents enjoy the same fundamental protections as real property. IBM, like any property owner, is entitled to insist that others respect its property and to demand payment from those who take it for their own use. Defendants have built their business model on the use of IBM's patents. Moreover, despite IBM's repeated attempts to reach a business resolution, Defendants refuse to negotiate a license to IBM's patent portfolio. This lawsuit seeks to stop Defendants from continuing to use IBM's intellectual property without authorization.

THE PARTIES

30.   Plaintiff IBM is a New York corporation, with its principal place of business at 1 New Orchard Road, Armonk, New York 10504.

31.   Defendant Zillow Group is a Washington corporation with a principal place of business at 1301 Second Avenue, Floor 31, Seattle, Washington. Zillow Group may be served with process at its registered agent C T Corporation System, 818 West Seventh Street, Suite 930, Los Angeles, California 90017.

32.   Zillow Group "operates the largest portfolio of real estate and home-related brands on mobile and the web which focus on all stages of the home lifecycle: renting, buying, selling and financing."[39] Zillow Group provides a "comprehensive suite of marketing software and technology solutions to help real estate, rental, and mortgage professionals maximize business opportunities and connect with millions of

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[39] Ex. 4 (Zillow Group 2018 10-K) at 3.

1   consumers."[40]   Zillow Group generates revenue at least based on the "sale of advertising

2   under [its] Premier Agent and Premier Broker programs."[41]   Zillow Group's portfolio

3   of real estate and home-related brands includes Zillow.   Zillow Group owns and

4   completely controls Zillow, Inc.

5   33.   Defendant Zillow, Inc. is a Washington corporation with a principal place

6   of business at 1301 Second Avenue, Floor 31, Seattle, Washington.   Zillow, Inc. may

7   be served with process at its registered agent C T Corporation System, 818 West

8   Seventh Street, Suite 930, Los Angeles, California 90017.   Zillow, Inc. also operates

9   the Zillow website, including at least www.zillow.com, www.zillowgroupmedia.com,

10 and subdomains thereof, and the Zillow mobile applications, including at least the iOS

11 and Android Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent

12 applications.   Zillow, Inc. provides online real estate listings and related services to

13 consumers and local real estate agents through Zillow's website and through the Zillow

14 mobile applications.

15   34.   Zillow operates "Zillow Offers," "which allows homeowners to [] sell their

16 home directly to Zillow . . . [and then Zillow] makes certain repairs and updates, and

17 then lists it for sale on the open market."[42]   Zillow operates "Zillow Offers" in the

18 Central District of California.

19   **FACTUAL BACKGROUND**

20 **A.   IBM Is A Recognized Innovator.**

21   35.   IBM is recognized throughout the world as a pioneer in many aspects of

22 science and technology.   On eight occasions, more times than any other company or

23 organization, IBM has been awarded the U.S. National Medal of Technology, the

24 nation's highest award for technological innovation.   During IBM's over-100-year

25 history, IBM's employees have included six Nobel laureates, six Turing awards, five

26

27 _____
    [40] *Id.*

28 [41] *Id.*
    [42] *Id.* at 10.

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National Medal of Science recipients, and at least twenty-five inventors in the National Inventors Hall of Fame.

36.   These and other IBM employees have introduced the world to technology that the global community takes for granted today, including the dynamic random access memory—DRAMs—found in nearly all modern computers; magnetic disk storage—hard disk drives—found in computers and portable music players; and some of the world's most powerful supercomputers, including Deep Blue, the first computer to beat a reigning chess champion and which is on display at the Smithsonian's National Museum of American History in Washington, D.C. IBM's commitment to developing these types of advanced computing technologies has helped to usher in the information age.

B.   IBM Is Committed To Protecting Its Innovations Through The Patent System.

37.   IBM's research and development operations differentiate IBM from many other companies. IBM annually spends billions of dollars on research and development, yielding inventions that have literally changed the way the world works. For over two decades the United States Patent and Trademark Office ("USPTO") has issued more patents to IBM than to any other company in the world.

38.   Like the research upon which the patents are based, IBM's patents also benefit society. Indeed, the Supreme Court has recognized that the patent system encourages both the creation and the disclosure of new and useful advances in technology. Such disclosure, in turn, permits society to innovate further. And, as the Court has further recognized, as a reward for committing resources to innovation and for disclosing that innovation, the patent system provides patent owners with the exclusive right to prevent others from practicing the claimed invention for a limited period of time.

C.   IBM Routinely Licenses Its Patents In Many Fields But Will Enforce Its Rights Against Those Who Use Its Intellectual Property Unlawfully.

1   39.   IBM's commitment to creating a large patent portfolio underscores the

2   value that IBM places in the exchange of innovation, and disclosure of that innovation,

3   in return for limited exclusivity. Indeed, IBM has used its patent portfolio to generate

4   revenue and other significant value for the company by executing patent cross-license

5   agreements. The revenue generated through patent licensing enables IBM to continue

6   to commit resources to innovation. Cross licensing, in turn, provides IBM with the

7   freedom to innovate and operate in a manner that respects the technology of others.

8   40.   Given the investment IBM makes in the development of new technologies

9   and the management of its patent portfolio, IBM and its shareholders expect companies

10   to act responsibly with respect to IBM's patents. IBM facilitates this by routinely

11   licensing its patents in many fields and by working with companies that wish to use

12   IBM's technology in those fields in which IBM grants licenses. When a company

13   appropriates IBM's intellectual property but refuses to negotiate a license, IBM has no

14   choice but to seek judicial assistance.

15   **D.   IBM Invented Methods For Presenting Applications And Advertisements
      In An Interactive Service While Developing The PRODIGY Online**
16   **Service.**

17   41.   The inventors of the '849 patent developed the patented technologies as

18   part of IBM's efforts to launch the PRODIGY online service ("Prodigy"), a forerunner

19   to today's Internet, in the late 1980s. The inventors believed that to be commercially

20   viable, Prodigy would have to provide interactive applications to millions of users with

21   minimal response times. The inventors believed that the "dumb" terminal approach that

22   had been commonly used in conventional systems, which heavily relied on host servers'

23   processing and storage resources for performance, would not be suitable. As a result,

24   the inventors sought to develop more efficient methods of communication that would

25   improve the speed and functionality of interactive applications and reduce equipment

26   capital and operating costs.

27   42.   In light of the above considerations, the inventors developed novel

28   methods for presenting applications and advertisements in an interactive service that

1   would take advantage of the computing power of each user's PC and thereby reduce

2   demand on host servers, such as those used by Prodigy. The inventors recognized that

3   if applications were structured to be comprised of "objects" of data and program code

4   capable of being processed by a user's PC, the Prodigy system would be more efficient

5   than conventional systems. By harnessing the processing and storage capabilities of the

6   user's PC, applications could then be composed on the fly from objects stored locally

7   on the PC, reducing reliance on Prodigy's server and network resources.

8   43.   The service that would eventually be called Prodigy embodied inventions

9   from the '849 patent when it launched in late 1988, before the existence of the World

10   Wide Web. The efficiencies derived from the use of the patented technology permitted

11   the implementation of one of the first graphical user interfaces for online services. The

12   efficiencies also allowed Prodigy to quickly grow its user base. By 1990, Prodigy had

13   become one of the largest online service providers with hundreds of thousands of users.

14   The technological innovations embodied in these patents persist to this day and are

15   fundamental to the efficient communication of Internet content.

16   **E.   IBM Invented Methods For A Runtime User Account Creation Operation
17   Using A Single-Sign-On Process In A Federated Computer Environment.**

18   44.   The inventors of the '346 patent developed the patented technology as part

19   of IBM's efforts to improve single-sign-on technology. To access a protected resource

20   at a service provider on the Internet, a user typically has to authenticate him or herself

21   with the service provider. Single-sign-on technology facilitates a user's connection to

22   resources by requiring only one authorization operation during a particular user session.

23   However, conventional technology at the time of the invention required that the user

24   already have an account with the service provider to use single-sign-on technology.

25   45.   The inventors of the '346 patent sought to develop single-sign-on

26   technology that would permit a new user of a service provider to access protected

27   resources. They developed novel methods for systems interacting within a federated

28   computing environment to trigger a single-sign-on operation on behalf of a user that

would obtain access to a protected resource and create an account for the user. The specification discloses how to structure a federated computing environment and the sequence and content of interactions between different systems that can support the patented methods. The '346 patent thus extends the benefits of single-sign-on technology.

F.   IBM Invented A Method For Computing The Desirability Of A Geographic Area By Converting Unstructured Image Data Into Structured Data.

46.   Artificial intelligence (AI) and Machine Learning are two fields of computer science which focus on inventing new technologies that provide computers with the ability to "learn" and "think" on their own, without human intervention. More specifically, AI is concerned with creating computers that have the ability to make intelligent decisions on their own. AI often uses machine learning to achieve this goal. Machine learning researchers create solutions that allow computers to learn from sets of data, and make predictions and decisions based on said data, in a way that mimics human "learning" or "thinking" but that is inherently wholly different from how humans "learn" and "think."

47.   IBM is a pioneer in both AI and machine learning. As early as the 1950s, IBM computer scientists began working on "chess computing," or teaching a computer to play chess. In order for a computer to successfully play a game of chess, it must have the ability to make decisions about which moves to make, as a person would. IBM's efforts culminated in Deep Blue, a chess computer pictured below. Deep Blue's computing system used various algorithms and machine learning tools to consider over 200 million possible chess positions per second, in order to select the move with the greatest probability of success. On May 11, 1997, Deep Blue defeated the reigning world chess champion, Garry Kasparov, after a six-game match:

Ex. 32 (https://www.ibm.com/blogs/think/2017/05/deep-blue/).

48.   From Deep Blue, IBM went on to develop even more advanced AI and machine learning technologies, including Watson, IBM's suite of AI and machine learning-based services and applications. Watson additionally uses Natural Language Processing (NLP), or the ability of a computer to read and understand sentences as a person would, to further approximate "thinking" like a human using complex processes uniquely tailored to the limitations of computers and machine languages. To this day, IBM's Watson technology has been applied to solve numerous real-world problems, such as city infrastructure planning and personalized school curriculum design, among many others. In 2011, an IBM Watson computer even defeated two Jeopardy! quiz show champions:

Ex. 33 (https://www.cbsnews.com/news/ibm-watson-defeats-humans-in-jeopardy/).

49.   Computer vision is a sub-field of AI and machine learning technology, which focuses on teaching computers to "think" like a human in order to "see" and derive information from visual images. A device enabled with computer vision may have the ability to categorize the features found within a photograph. In recent years, researchers have used various methods to attempt to create said computer vision. One approach is to use large numbers of humans to manually provide information about images. For example, in 2006, Google launched the Google Image Labeler. Through the Image Labeler game, Google enlisted the help of millions of online users in order to choose the category of features found within Google's database of images. In the game, two different users would be shown the same set of images, and each player would earn points for giving the same label or category (such as "Dogs," "Cats," "Food," "Cars," etc.) to a photograph. Google used these user-inputted labels in order to improve its image classification software. An example of Google Image Labeler gameplay is shown below:
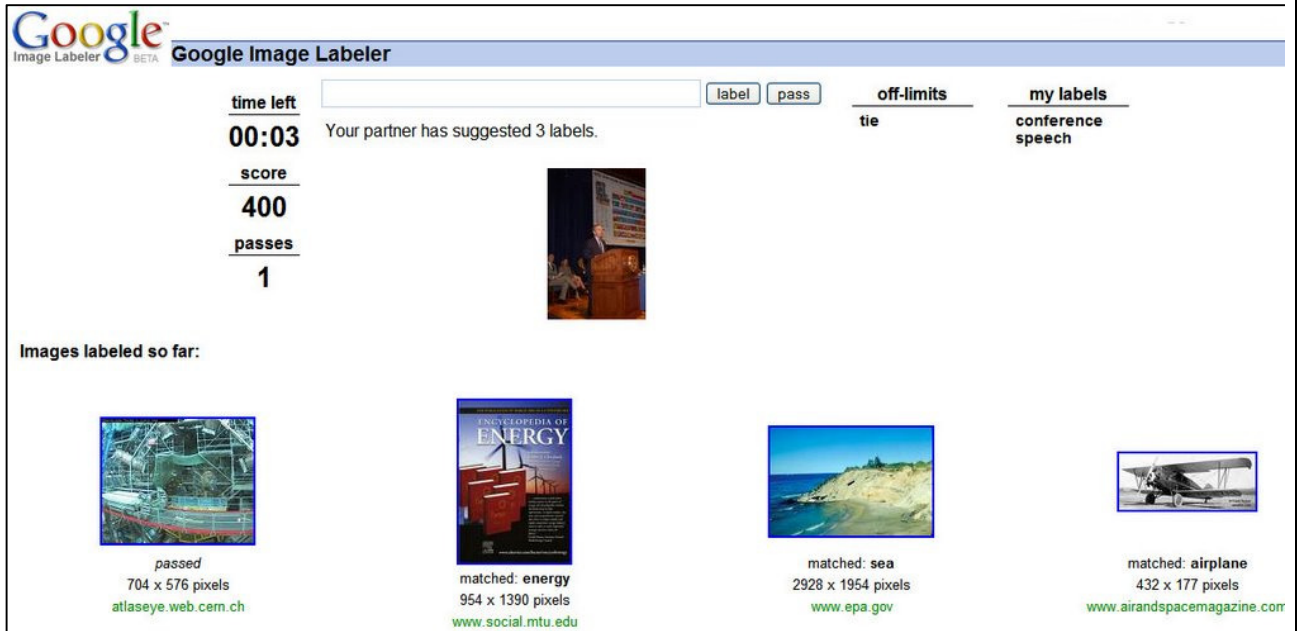
Ex. 34 (Google Image Labeler, Google Operating System: Unofficial news and tips about Google, http://googlesystem.blogspot.com/2006/09/google-image-labeler.html).

50.   The inventors of the '183 patent took a different approach to developing computer vision capabilities. Their approach started with the idea that there existed in the world a large amount of publicly-available, unutilized unstructured data in the form of image data. Examples of this unstructured image data include video feeds from security cameras, photos taken on cell phone cameras and then uploaded to social media and the Internet, and images and videos from news stories, among others. While these images contained valuable information about their subject matter, including indications of quality not easily captured by statistics and other traditional forms of structured data, the image data itself was not traditionally stored in a computer-readable format. In other words, computers could not "see" the image data in order to incorporate it into computer programs and processes.

51.   For house hunters trying to locate a neighborhood or a specific home to move to, there existed a large quantity of publicly-available image data showing the conditions within these homes or neighborhoods. As an example, programs like Google

1   Street View captured large amounts of said image data. These images contained

2   information about qualities determinative of whether a neighborhood, or a particular

3   home within a neighborhood, is desirable, such as whether a property has well-

4   maintained landscaping, intact windows, ample lighting from street lamps, freshly

5   painted walls, no graffiti, and much more. The inventors of the '183 patent recognized

6   that there was a need for a system that could aggregate all of the information about

7   home and neighborhood features found within this image data. In other words, there

8   was a need for a computer with the ability to evaluate these images in order to gain an

9   "intuitive" sense of a particular area without relying on human users to label the data.

10   To solve this problem, the inventors of the '183 patent turned to AI and machine

11   learning.

12   52.   With these goals in mind, the inventors of the '183 patent created a novel

13   technique for a computer to determine a score representing the location conditions of a

14   home or neighborhood, and to present those results to a user in the form of an easily

15   understandable map. The inventors of the '183 patent designed a system that would

16   collect unstructured image data of homes and/or neighborhoods, and then filter the data

17   into a structured format in order to analyze the newly structured data for relevant

18   elements or specific conditions shown within the images. In other words, the image

19   data was converted from a regular photograph or video stream into individual data units,

20   so that a computer system could analyze patterns within the individual pixels of the

21   images, and recognize specific features within the images themselves. By breaking an

22   unstructured image into individual units of data, the computer gained the ability to "see"

23   features in the images, by analyzing the individual units of the image data for relevant

24   elements.

25   53.   The inventors of the '183 patent appreciated that this set of stored image

26   data could be used to form baseline measurement values for different home features by

27   converting   the   large   set   of   image   data   into   structured   data.

28   By using this store of image data and baseline measurement values, the system of the

1   '183 patent eliminated the need for manual scoring of conditions within an image.

2   Instead, as soon as new image data is received by the system and converted from

3   unstructured to structured form, the computer can compare the features within the new

4   images to this store of image data containing baseline values for each of the

5   home/neighborhood features in order to evaluate the conditions in the new image data.

6   54.   The inventors of the '183 patent also recognized that in order to provide

7   helpful information to users about the conditions within a home or neighborhood, the

8   system would need to not only classify the features found within the images (such as

9   available parking, street lamps, windows, etc.), but also make a determination of the

10   quality of said features. Instead of just identifying which conditions exist within an

11   image, the computer system of the '183 patent also makes a subjective determination

12   of the quality of each home or neighborhood condition (e.g., with a score from 1-10,

13   with 1 indicating the "worst" condition, and 10 indicating the "best" condition). The

14   inventions of the '183 patent therefore provide a qualitative assessment of various

15   conditions within a home and/or neighborhood by using already existing unstructured

16   data. These qualitative assessments by the computer result in condition score values

17   for various conditions, which can be aggregated into one overall condition score value

18   for the entire home/neighborhood.   Therefore, instead of spending hours looking

19   through large quantities of image data, a house hunter can instead look at one simple

20   numerical value to determine the desirability of a home and/or neighborhood.

21   55.   The inventors of the '183 patent also recognized that this novel technique

22   could be used to further IBM's Smarter Cities efforts, in order to improve neighborhood

23   public safety. The IBM Smarter Cities initiative focuses on using technologies like AI

24   and big data to improve the functioning of city governments, as well as the quality-of-

25   life of citizens in general. The '183 patent's inventors recognized that this novel

26   technique could be used by local police departments to augment public safety efforts

27   and improve the efficiency of the police force. Police departments could use the

28   inventions of the '183 patent to automatically convert streams of security camera

footage into condition scores which give a clear indication of which areas are at high risk, and may require police presence. For example, an area with a burning fire, angry individuals, and cars with broken windows would be given an overall condition score value corresponding to a high risk, and the local police would be alerted that police attention is needed in that area. By providing greater situational intelligence in a hyper-localized context, the inventions of the '183 patent could significantly reduce crime levels by increasing the efficiency of the police force. Overall, the novel technique of the '183 patent provides a simple and accurate process for determining and presenting the conditions of an area that did not exist in the prior art.

G. IBM Invented Methods For Filter-Based Selection And Synchronizing Of A Map Display And A List Display.

56.   The inventions of the '789 patent provide a new way of filtering and presenting geospatial data in response to user interaction. At the time of the inventions of the '789 patent, increases in computing power and storage allowed an ever-growing amount of data to be stored in digital databases. A common type of data was geospatial data—that is, data that can be represented on a map—which presented additional specific challenges. An example of geospatial data are points of interest, which can be indicated with icons that are overlaid on a map. The computing devices of the time were able to search through millions of such points of interests and display those results in a map, as well as displaying information about those results. At the same time, advances in computing devices allowed users to interact with the results in new ways, such as allowing a user to click an area of the map occupied by an interactive icon to display a balloon containing additional information about said icon.

57.   However, the technology at the time limited how that data could be displayed and how users were able to interact with it. In particular, the mapped geospatial data was not dynamically responsive to the user's selections in the way claimed by the inventors of the '789 patent. Prior to the inventions disclosed in the '789 patent, users were presented with all, or a set number, of results that fit within the area

1   of the screen designated for the map, and users could not select a subset of data to be

2   displayed in the way claimed by the '789 patent. For example, when results were

3   displayed on a map in response to a user's search for hotels, the user could not then

4   select a subset of the hotels to automatically update the map to only show the selected

5   hotels. The prior art's approach to providing search results thus had several limitations.

6   While helpful for users to be able to visualize the location of search results, prior art

7   approaches did not allow for a user to create a customized search area to fit a user's

8   specific geographical needs. For example, a person searching for rental properties may

9   want to search within an irregular shaped area determined by the acceptable walking

10 distances between several modes of public transportation. Or they may wish to create

11 a search that excludes particularly noisy blocks, tourist attractions, or neighborhoods

12 that they wish to avoid.

13   58.   The inventors of the '789 patent encountered these obstacles in their

14 development of IBM's Intelligent Operations Center for Smarter Cities ("IBM's IOC"),

15 which allowed personnel in command centers to track conditions and events on an

16 interface containing a geospatial map and an associated list display. For example, in

17 IBM's IOC, city personnel could monitor a wide range of city assets, from sidewalks

18 and sewers to police cars and traffic lights. The software drew on information collected

19 from multiple sensors, such as traffic cameras and rain meters, to enable personnel to

20 quickly assess the status of assets and their impact on particular city services. During

21 events, these personnel could use the software for real-time monitoring and to

22 coordinate responses, such as placing traffic signs at different locations, or transporting

23 police. But these personnel also needed to be able to interact with the map to select

24 specific city assets or ensure city resources were ready for emergencies. Further, they

25 needed to be able to track different categories of conditions and components. For

26 example, city personal might need to track the conditions of water lines at the same time

27 they track the conditions of transportation resources. A solution was needed that

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1 allowed city personnel to make informed decisions by allowing them to interact with

2 different types of conditions in a uniform manner.

3   59.   Specifically, personnel in a command center using IBM's IOC needed to

4 focus on results in specifically shaped regions so as to observe of events in specific

5 neighborhoods. To respond to these events, they needed to be able to update the results

6 after visualizing geospatial information, analyzing the information, and deselecting

7 irrelevant results. But if a person's desired geographical search area did not neatly

8 conform to the designated square the map was displayed in, they were presented with

9 many irrelevant results, which could lead to frustration or wasted resources.

10 Particularly, if only a subset of search results were displayed on the map at a time, a

11 user would have to review every result to ensure they did not miss relevant results.

12 Using the prior methods of searching and filtering, a user would be forced to sort

13 through results that did not fit their search criteria, but were automatically returned

14 because they fit within the map's dimensions on the screen. In contrast, the '789 patent

15 allowed a user to designate their own area of the map to search and to select all of the

16 results within that area for display to the user.

17   60.   The inventors of the '789 patent achieved this innovative method of

18 searching by allowing for greater interactivity and the ability to select a customized area

19 of the map display in order to update the selection in both the map and list. Specifically,

20 the inventors of the '789 patent realized that a user could get more relevant search

21 results if they were able to use input/output devices to draw a selection area of a user-

22 determined shape on the map display. The search results displayed on the map were

23 then filtered by selecting and deselecting elements according to the user-determined

24 selection area, giving users the ability to deselect the elements they were not interested

25 in. This functionality was accomplished by the inventors of the '789 patent using an

26 approach to filtering based on deselection. Unlike highlighting an item on a map or

27 highlighting a list item, which only emphasized wanted results, the approach of the '789

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1   patent deemphasized unwanted results by deselecting elements outside of the user

2   drawn selection area.

3   61.   Further, by synchronizing the map display and the list display to

4   concurrently update the results, a user was presented with detailed information about

5   the points of interest in the user-designated area. The invention was incorporated into

6   IBM's IOC and used by personnel in command centers to aid their decision-making by

7   allowing them to more finely filter their results and hone in on the most relevant

8   information.
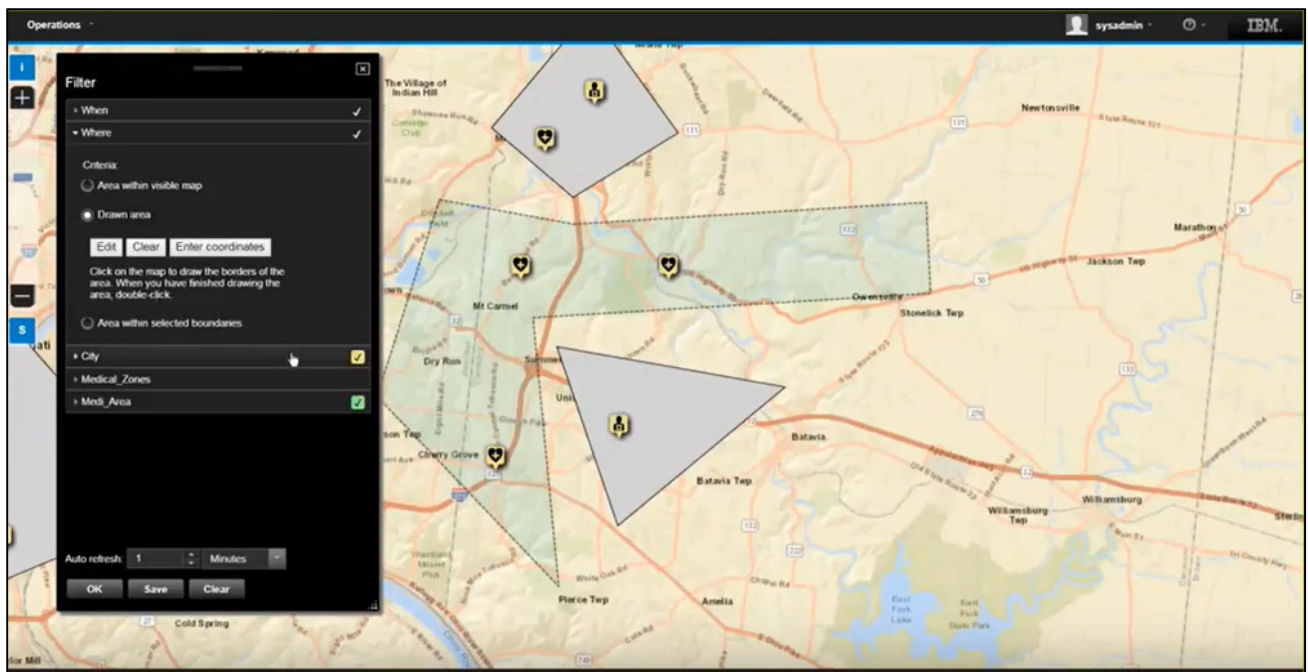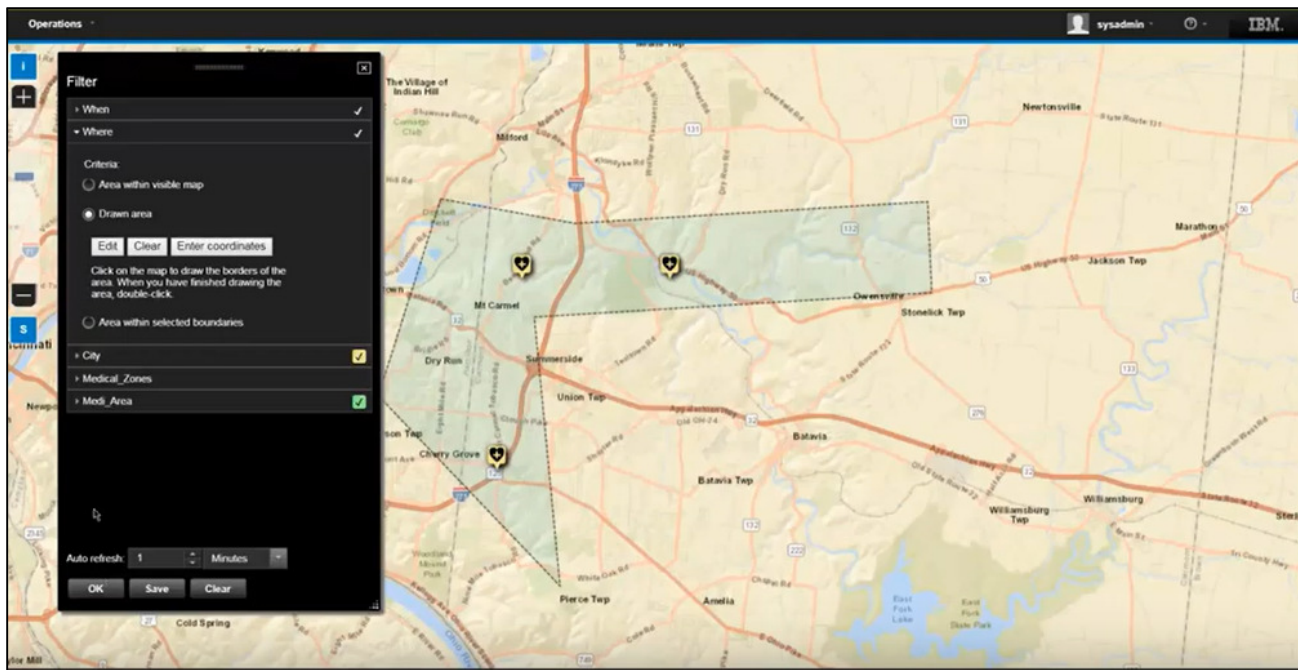
Ex. 35 (From https://www.youtube.com/watch?v=x3iHUNBkTDQ at 00:56 and 00:58).

62.   Before the invention of the '789 patent, personnel using IBM's IOC would have to rely on long-range predictions for trends and directions. Now, they can view real-time information on critical infrastructure and assets, such as medical facilities, public transportation, fire hydrants, and water treatment plants. The inventions of the '789 patent were successfully integrated into IBM's IOC and played an integral role in the success of this product. The novel technologies of the '789 patent greatly improved upon the prior art by allowing for multiple linked selection and filtering capabilities in the displays and bidirectional interaction between the list and map displays, regardless of the users' experience with different operating systems. This allowed users to more finely filter their search criteria and obtain more relevant results than prior art methods. The inventions of the '789 patent thus allow personnel to more effectively respond to events and to monitor assets and infrastructure using the claimed invention to deemphasize excess information.

H.   IBM Invented Methods For Improving Graphical User Interfaces By Using Layers To Simultaneously Display Multiple Object Categories.

63.   At the time of the inventions of the '389 patent, the capabilities of computing devices and networking equipment were being improved and developed at a rapid rate. At the same time, systems that took advantage of these improvements were being implemented in all areas of industry. These increased-capability systems were often much more complex than their predecessors due to the implementation of these new technologies. Examples of such complex systems include the inventory of a company or store, the hardware and software components of large organizations, and the employees of large municipalities. Although these complex systems could hold more data than past simpler systems, the large amount of data in these systems meant that it was more complicated to track and manage the operations of the system. In order to effectively oversee these systems, users needed to be able to tell how each component functions in the system as a whole, how each component is interrelated with other components, and how to holistically understand and visualize the entire architecture of the system. A need to better monitor these systems arose.

64.   The inventors of the '389 patent developed the patented technologies as part of IBM's efforts to improve technology for displaying information and objects in complex systems using a graphical user interface. Due to the increasing complexity of the systems being developed, various methods were used to improve visualization of the components of such systems. At the time of the invention, data systems had fewer components, and thus visualization of the components based on spatial positioning was sufficient. For example, U.S. Patent No. 5,500,934 (Exhibit 36), filed in 1994, discloses displaying objects of a LAN network by positioning the objects in defined locations. For another example, U.S. Patent No. 6,005,578 (Exhibit 37), filed in 1997, discloses grouping objects into levels. Though such methods were adequate in those earlier years, by 2001, as systems continued to grow in complexity and the number of objects comprising such systems increased, the use of these methods became problematic. The volume of information and components of these new systems made it difficult to organize and present information on a computer's two dimensional screen using

existing methods in a way that was both comprehensive and understandable.   In

particular, using such methods to display all of the information or components at once

resulted in an overly cluttered display with various objects overlapping each other. This

made it difficult, if not impossible, to determine the relevant details of and relationships

between the information that a user was attempting to view.

65.   Additionally, complex systems also started to be comprised of more

categories of objects. As an example, an organization can be comprised of several

computing devices, such as personal computers and servers, various peripheral devices,

such as printers and routers, and various types of software, such as application software

and middleware software. A user managing such a system needed to be able to identify

and view these various categories of objects to understand how the various parts of the

system interact together to diagnose any issues or deficiencies that may be present.

However, the cluttering and overlapping of objects in existing methods for displaying

such information made it impossible to decipher the relationships between the various

pieces of information and components. Moreover, the computer systems were unable

to independently determine the categories and apply the differences. Thus, there was a

need in the prior art to be able to display, on a two dimensional computer screen, a large

amount of information in a manner that allowed a user to seamlessly distinguish and

navigate between various groups of related information so that users can effectively

monitor and manage their system.

66.   The IBM Tivoli team recognized the difficulties businesses dealt with in

trying to monitor and manage their business systems due to the increasing level of

complexity and the increasing number of resources comprising the systems. The Tivoli

team thus sought to develop the Tivoli Global Enterprise Manager ("GEM") in order to

provide their business clients with an all-inclusive solution for managing all aspects of

their clients' business environment. The most pertinent problem identified by the Tivoli

team was the users' inability to understand their business system as a whole. Because

of the vast number of resources and interdependencies between such resources,

1   businesses needed a solution to be able to distinguish between each of these various

2   resources and to be able to easily comprehend how these resources interact.   The

3   inventions of the '389 patent resolve these problems by disclosing a method that allows

4   for effective monitoring of the objects of the system even where the display of the

5   objects are clustered and overlapping one another by grouping objects of a category into

6   layers, applying non-spatially distinguishable display attributes to the objects of these

7   layers, and applying a display emphasis on prioritized layers.   Though the solution was

8   ultimately not included in the commercialized version of the GEM due to the timing of

9   the development of this feature, the inventors foresaw that the need for the inventions

10   of the '389 patent existed at the time of the invention and would continue to exist from

11   that point forward due to the inevitably increasing complexities of all systems.

12   67.   The application of the non-spatially distinguishable display attributes to

13   different layers of objects was one of the features developed in response to the

14   ineffectiveness of prior art methods at the time of the invention.   The prior art methods

15   grouped objects without using non-spatially distinguishable display attributes.   Such

16   grouping and organizing is sufficient in a lower complexity system, but by the time the

17   technology of the '389 patent was invented, many systems were comprised of thousands

18   of objects.   The inventors of the '389 patent, noting that using prior art methods on these

19   complex systems would lead to an incomprehensible display of overlapping and

20   cluttered objects, developed an innovative method that accounts for the cluttered display

21   by using non-spatially distinguishable display attributes.   The use of such attributes

22   allows a user to still see the groupings of objects that the user desires even when they

23   are cluttered with other objects by visually distinguishing these objects.   Thus, for

24   example, if a red hue is applied to the objects of the layer, a user would be able to see

25   the layer even where there are thousands of other objects on display by noting which

26   objects are red. Additionally, the patent discloses a method allowing a user to rearrange

27   the various layers to allow the user to effectively monitor their system with different

28   points of view. For example, in a hotel inventory management system, the user may

1 want to view layers of hotels based on their star rating. If the user then elects to view

2 layers of hotels based on their location, the patent discloses a method wherein the hotels

3 are re-matched to a different layer based on location, and a different non-spatially

4 distinguishable display attribute is then applied to the hotels of each of these new layers.

5   68.   The methods in existence at the time of the invention also did not include

6 the implementation of applying a display emphasis to visually distinguish between

7 layers in the way claimed by the inventors. Because systems had fewer objects when

8 the prior art methods were developed, there was no need to distinguish between layers.

9 It was sufficient to group together the objects and allow a user to navigate between these

10 groups. However, as the number of objects in a system increased, merely navigating

11 between spatially-separated groups of objects was insufficient for focusing on one

12 group over another because of insufficient space on a screen to allow for a feasible

13 display of these groups. Therefore, not only did the inventors introduce the use of non-

14 spatially distinguishable display attributes to represent various layers, the inventors also

15 disclosed the implementation of a display emphasis between layers so that users could

16 readily focus on a specific layer. The application of a display emphasis allows one layer

17 to be emphasized over the other layers, such as by overlapping the focused layer over

18 the others or by saturating the color of that focused layer, so that the user can easily

19 view the layer that is prioritized. Additionally, the invention discloses reapplying the

20 display emphasis when the layers are reordered. This allows the user to navigate

21 between layers by emphasizing the newly prioritized layer over the other layers. The

22 addition of a display emphasis thus enables users to view the layers in a particular order.

23   69.   The inventions of the '389 patent are not the only possible solution to the

24 need for effective display of a large number of objects. Other solutions existed as well,

25 but lack some of the advantages of the invention. For example, the display technology

26 used by Yelp allows the user to select a single category of objects at a time and displays

27 only the objects of that category on their map.

28
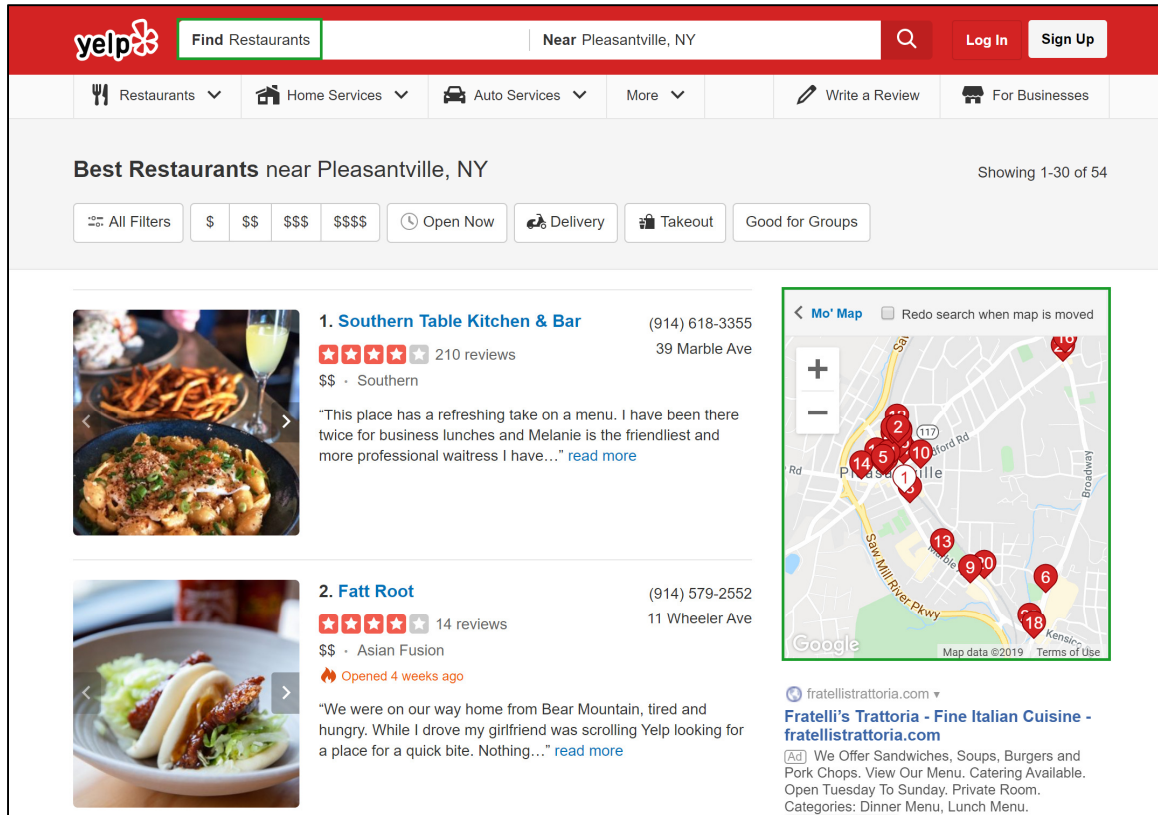
Ex. 38 (https://www.yelp.com/search?

find_desc=Restaurants&find_loc=White%20Plains%2C%20NY).
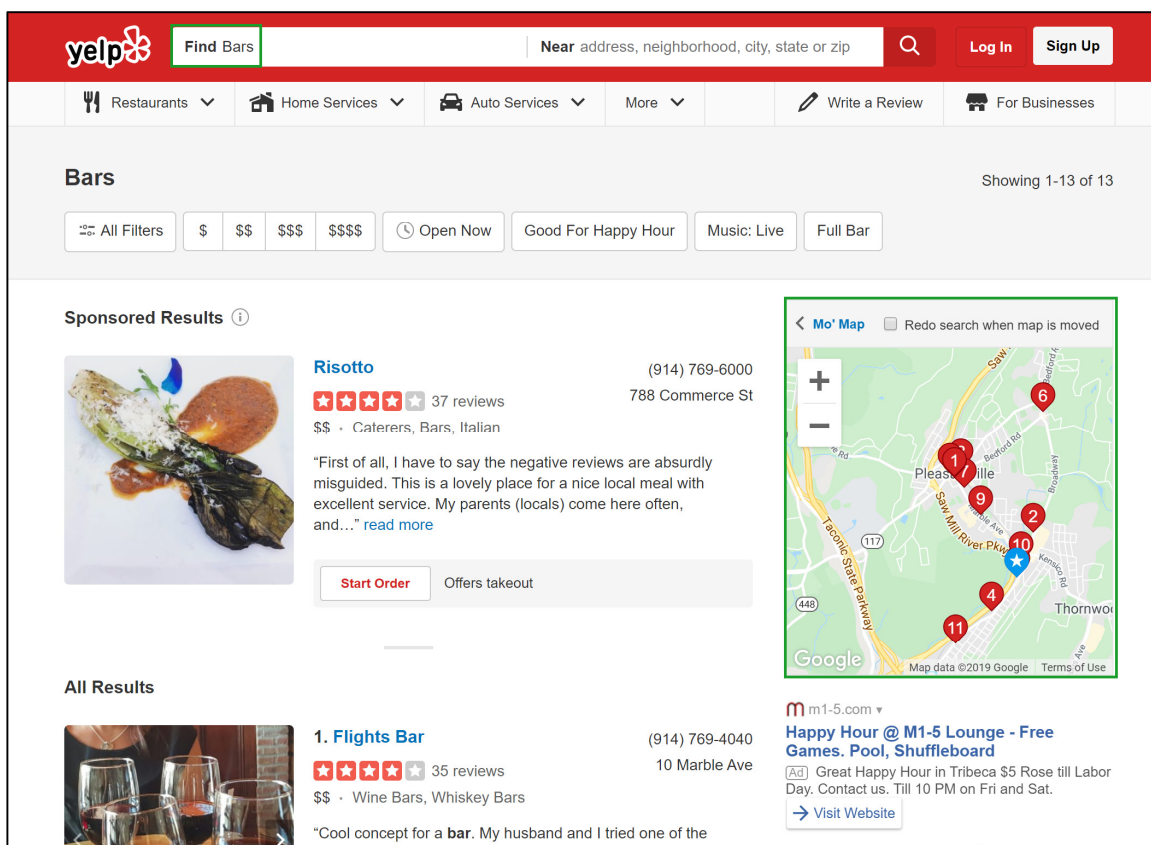
Ex. 39 (https://www.yelp.com/search?
find_desc=Bars&find_loc=Pleasantville%2C%20NY).

70.   Though this method ultimately allows a user to view the objects within the inventory of Yelp by viewing each category separately, it fails to include the use of displaying layers wherein the objects of each layer are displayed using non-spatially distinguishable display attributes. The use of layers allows a user to see the various objects of the system at one time to provide the user with a better understanding of the various objects present in the system. In the case of Yelp, using the inventions of the '389 patent would provide a user a better understanding of the composition of establishments in the town and the total number of options that a user can consider to plan out the user's itinerary.

71.   Another alternative solution was invented by Robert Uthe, one of the co-inventors of the '389 patent, and disclosed in U.S. Patent No. 10,250,454 (Exhibit 40, the "'454 patent"). The '454 patent teaches grouping all the objects with a selected

attribute into a single subgroup represented by a display element shown on the computer screen. The user can select this display element to view information common to all the objects of that subgroup. Although the '454 patent does teach a particular solution for displaying the numerous components of a system, the '389 patent's invention includes advantages that the '454 patent's invention is missing. In particular, the use of layers allows a user to visually understand the number of components each layer is comprised of and also allows a user to select a specific object of a layer as opposed to having to select the entire set of objects.

I.   IBM Invented Methods For Automatically Associating Related Advertisements To Individual Search Results Items.

72.   The inventors of the '443 patent developed the patented technologies as part of IBM's efforts to improve Internet search engine technology in the area of e-commerce solutions and, in particular, targeted advertisements. Prior to the inventions of the '443 patent, with the accelerated growth of the Internet and its associated e-commerce activities, advertising over the Internet became increasingly more acceptable to Internet users, and marketing professionals looked for ways to optimize online advertising. But the technology used to deliver targeted advertisements to Internet users based on user profiles presented unique challenges, different from those faced by offline advertising (such as person-to-person marketing) because computers could not determine from context alone what advertisement should be shown in users.

73.   One possible solution was targeted banner advertising. At the time of the inventions of the '443 patent, it was typical to provide banner advertisements, or banner ads, to website users. Banner ads are a form of online advertising that embed advertisements into a website, typically appearing on a site as a bar, column, or box. An early banner ad is seen in the image below:

1   Ex. 41 (https://www.theatlantic.com/technology/archive/2017/04/the-first-ever-

2   banner-ad-on-the-web/523728/).

3

4   74.   At the time of the inventions of the '443 patent, online advertising focused

5   on targeting specific banner ads to a specific audience that would hopefully include

6   those Internet users who were most likely to be interested in, and make use of, the

7   advertised product. In particular, advertisers displayed pre-selected advertisements for

8   a general audience or for a target audience based on user profiling. Profiling involved

9   assimilating information from user profiles collected from each Internet user on the

10   basis of the user's areas of interest and parameters of the user known to the system.

11   Websites could relate the user to one or more stereotypes, operate stereotypic rules, and

12   deliver a targeted advertisement to a user on the basis of those rules. Advertisers would

13   collect the information required to build a user profile by sending a small piece of data

14   (called a cookie) from a website and storing it on the user's computer while the user is

15   browsing, and later retrieving that cookie on a subsequent visit to the site by the user.

16   For example, a user would visit the website www.sears.com looking for an appliance

17   (such as a dishwasher). The website would send a cookie to the user's computer

18   indicating that the user was interested in dishwashers. If a user later returned to

19   www.sears.com, the website would see the cookie indicating the user's interest in

20   dishwashers, and present targeted advertisements to the user for various dishwashers

21   offered for sale by Sears.

22   75.   These targeted banner ads from user profiles were an effective form of

23   advertising on websites with high view rates, but they also had inherent drawbacks.

24   First, they were shown to users regardless of whether those ads had been specifically

25   solicited. Second, those ads relied on user profiling that required collecting data about

26   the user and building user profiles. Third, the user profiles were based on past user data

27   and thus were immediately outdated.

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76.   In particular, Internet-based advertising was not optimized to target only those users who were most likely be interested in, and make use of, the advertised product. For example, it was important, yet extremely difficult, to ensure that user profiles remain current. A user who was interested in, for example, buying an automobile may no longer be interested in it, simply because he or she had just purchased one. Additionally, past methods of user profiling targeted advertising schemes, which relied on tracking a user's web activity, wholly failed to account for offline purchases, or untracked online purchases, and would continue to deliver advertisements to users for products they had already bought. This was unacceptable to advertisers, who often paid based on the number of potential customers who viewed an advertisement. It was also unacceptable to Internet users, who had no viable means to express that they were no longer interested in the advertised goods, or to express that they were receptive to such advertisements.

77.   In addition, it was also difficult to identify a specific user, such as a user who recently became interested in purchasing automobiles, and associate the correct advertisement profile to the user. Prior art targeted advertising schemes based on user profiling could not solve this problem because the user profiles were built by analyzing users' past web activity, which was not necessarily reflective of their present interests. This problem was compounded by users for which profiles did not exist or by those who were browsing anonymously. In short, advertising using user profiles could not intelligently predict what advertisement should be shown in users.

78.   The inventors of the '443 patent recognized these limitations of the existing solutions and developed their novel technologies for associating an advertisement with a search result. The '443 patent's inventors developed a method that no longer relied on the use of user profiling, which was difficult and cumbersome to employ. The inventors realized that they could present relevant advertisements to users on demand by assimilating, correlating, and displaying advertisements during an Internet search, analyzing the search result to produce at least one keyword, and finally

identifying associated advertisements from a repository having a word that matches the keyword as related to the search result. Advertisements could therefore be more accurately targeted to users' current interests without having to rely on potentially outdated information contained in a user profile. Furthermore, by focusing on the search performed by the user, the inventors of the '443 patent were able to present relevant advertisements even if a profile did not exist for that particular user or the user was browsing anonymously. The inventors realized that this would provide a more accurate distribution of advertisements to users and likely increase the chance that users would click on the presented advertisements.

79.   More specifically, the inventors of the '443 patent devised methods for associating an advertisement with a result from an information repository search by a user. An information repository is a product database for potentially matching product advertisements to the search results. The association step involves analyzing the search result to produce a keyword, using that keyword to search for an associated advertisement within the repository, identifying the associated advertisement from the repository having a word that matches the keyword as related to the search result, and correlating the associated advertisement with the search result.

80.   Using the methods of the '443 patent, users would enter a search and receive search results. Those results were analyzed to produce a keyword relating to the search result, thereby eliminating the need for developing a complex user profile. That keyword could then be used to search within the information repository for potentially matching product advertisements (as opposed to prior art methods that displayed banner advertisements to users irrespective of whether they matched a keyword). When an advertisement matching the keyword was identified, it could be shown to the user. In this way, the inventors ensured that the advertisements were relevant to a user's present interest, instead of past interests (as was done with user profiling). Other novel methods of the '443 patent included providing the correlated advertisement to a user on-demand, thereby solving the problem of delivering ads to

users who were not interested in seeing them. Moreover, the associated advertisement could be displayed as a user-selectable icon containing a link to the associated advertisement, thereby giving the user a choice of whether or not to view the advertisement, further ensuring that advertisements were only delivered to those Internet users who would most likely be interested in, and make use of, the advertised product.

J.   IBM Invented Methods For Improving Computer-Generated Promotions By Using Promotion Templates.

81.   The inventors of the '904 patent developed the patented technologies as part of IBM's efforts to improve how promotions were generated and how they were subsequently managed and organized. At the time of the inventions of the '904 patent, increases in computer power and network speeds increased the number and complexity of online advertising. Marketers became particularly interested in individualized advertising, including both individualized advertisements and well as whole advertising campaigns, because of the increased effectiveness of such individualized advertising. However, there were significant obstacles to providing individualized advertisements and advertising campaigns online.

82.   Initially, marketers would create singular promotions and query a customer database in order to find a customer or group of customers to whom it applied. This created challenges for generating and keeping track of the various promotions that were created. In order to be effective, individual promotions needed to be quickly and efficiently created and delivered to the relevant customers. The number of individual promotions that needed to be generated could range from hundreds to thousands of individual promotions. Problems arose in trying to individually create each promotion for display to the relevant customers in a timely fashion. Individually creating each promotion could be extremely time consuming and resource intensive. It was possible that by the time each promotion had been created and made ready for display, the

1 information contained in the promotion had become outdated. Thus, there existed a

2 need to quickly and effectively create each individual promotion.

3   83.   Moreover, beyond the problem of how to quickly create the individual

4 promotions, there still existed the problem of finding the appropriate promotions,

5 organizing them, and getting those promotions to the right customers. Previous systems

6 generally allowed the marketers to choose the customers a promotion was sent to, which

7 risked a customer list that was over or under-inclusive of the relevant customer base. A

8 need existed to find and group related promotions together in a way so that they could

9 then be provided to the relevant customers. Compounding these problem, promotions

10 were needed in a multitude of various situations, all of which with different

11 requirements and needs. For example, marketers in different industries may have

12 specialized considerations as to promotion frequency, speed, and variation, and each

13 industry likely has different types of promotions directed to different types of products

14 or services. Thus, what was required was not a singular fix, but a method that allowed

15 different needs to be addressed using different implementations.

16   84.   The inventors of the '904 patent addressed these needs using promotion

17 templates that could dynamically create individual promotions and individual

18 promotion lists. Using the promotion templates, the inventors were able to create

19 collections of promotion instances (which are the individual promotions) and promotion

20 versions (which are specific implementations of those individual promotions). These

21 collections, called promotion lists, can be distributed to customers and used, for

22 example, as individualized promotion campaigns. To achieve this, the inventors

23 designed the promotion templates so that each one was an editable object that can

24 repeatedly produce multiple other promotion templates, promotion instances, or

25 promotion versions based upon specific parameters determined by the user. Therefore,

26 users can more easily store, manipulate, and distribute the promotions by creating a

27 promotion list populated by relevant promotions, generated through the use of various

28 promotion templates

1   85.   Promotion templates are able to create replicable promotions because they

2   may include both preassigned attributes, which will define the resulting promotion and

3   are likely to be used across all templates, and custom attributes, which may be unique

4   to a specific template or group of templates and are thus parameterized fields for which

5   users can change the values. For example, if a user wants to generate promotions for

6   specific flights, the attribute fields "FavoriteTrips.From" and "FavoriteTrips.To" could

7   be populated with the values "Boston" and "New York," respectively, for a customer

8   interested in traveling between those two cities. In this way a user can now generate

9   countless promotion instances or versions which advertise the price of trips from Boston

10 to New York for different dates and different price-points all produced by the same

11 template. If another customer's favorite cities to travel between were Atlanta to San

12 Diego, this same template could generate promotions to advertise flights on this route

13 to that specific customer. Thus, a single flights-specific template can be repeatedly used

14 in different scenarios. This made it possible to create a massive promotion database,

15 which could be easily queried, for the first time.

16   86.   Further, the innovative method of the '904 patent allowed those

17 promotions to be further individualized in specific promotion lists responsive to the

18 user's search query. Following from the previous example, a customer who is traveling

19 from Boston to New York might be shown a promotion list that includes promotions

20 for hotels in New York, promotions for activities in New York, as well as promotions

21 for flights from Boston to New York, all created from different promotion templates.

22   87.   As illustrated below, promotions in the prior art were distributed by first

23 being generated by a user, after which the promotion was sent to a customer or

24 customers deemed to be part of the relevant customer base for each respective

25 promotion. In this one-way process of distributing promotions, information was only

26 received from the consumers after the promotions were already sent.

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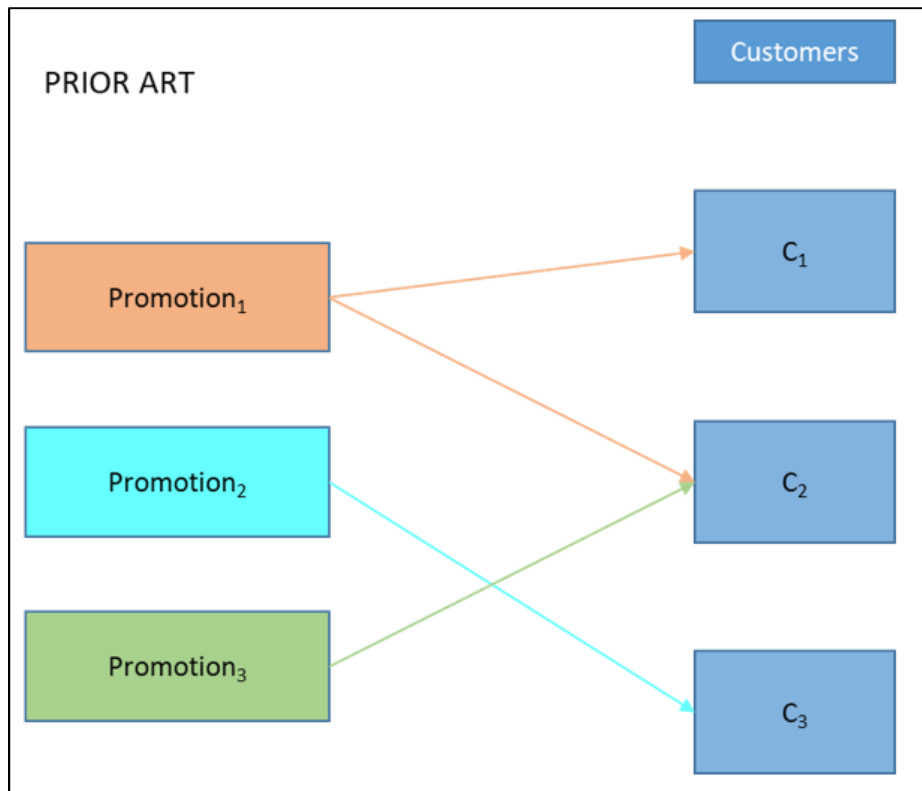
88.   In contrast, the inventors of the '904 patent developed a way to group the relevant promotions by using user-generated search queries to identify one or more attributes of a promotion that match the attributes of the search queries. As illustrated below, the methods of the '904 patent use promotion templates to create promotion instances or versions which are stored in a repository. The system first identifies certain attributes associated with the search query, and then retrieves promotions with matching attributes. The retrieved promotions can then be added to a promotion list, which is returned to the relevant customers. This method allows an individualized promotion list filled with individualized promotions. The inventors were thus able to generate a dynamic promotion list that could be updated, without user intervention, to reflect any changes in promotion instances by using a query that dynamically returns promotion instances that match the query. This reversed the previously utilized, one-way process, and, coupled with the ability of promotion templates to generate a large repository of promotions, allowed for this massive improvement in promotion distribution.
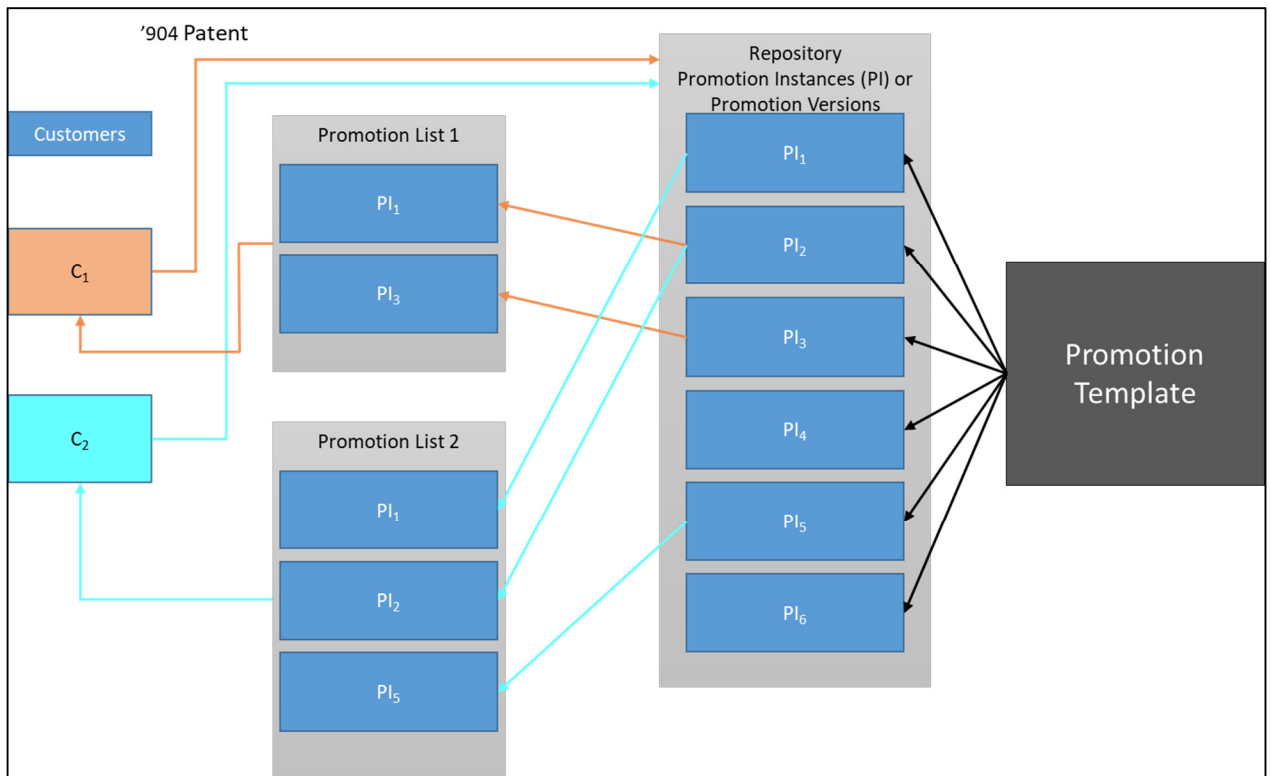
K.   Zillow Has Built Its Business By Infringing IBM's Patents.

89.   Zillow provides customers with access to real estate listings and provides real estate agents with advertisements and other services. Zillow also purchases homes directly from customers that they repair and sell.[43] Zillow Group and its subsidiaries have grown rapidly over the last several years and now have over one billion dollars of annual revenue.[44]

90.   Rather than build their business on their own technologies, Zillow has appropriated the inventions of the Patents-in-Suit. The website, including at least www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and the associated mobile applications, including at least the iOS and Android Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications, under Zillow's control use the technology claimed by the Patents-in-Suit to provide customers

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[43] Ex. 7 (https://www.zillow.com/offers/) (describing the process by which Zillow purchases and then sells homes).
[44] Ex. 4 (Zillow Group 2018 10-K) at 42.

1   with access to real estate listings; provide Zillow's Business-to-Business services,

2   provide advertisements and other services for real estate agents, including through

3   Promoted Communities for new constructions, Zillow's Premier Agent service, and

4   other properties involving Zillow Group Media; and buy, service, advertise, and provide

5   properties through Zillow Offers. IBM has informed Zillow of its infringement, but

6   Zillow continues to infringe despite the knowledge of their infringement.

7   91.   IBM has attempted to reach a patent licensing agreement to end Zillow's

8   unauthorized use of IBM's patents since at least June 2016. Since that time, IBM has

9   sent Zillow numerous letters concerning their infringement of the Patents-in-Suit. IBM

10 has also met and held telephone calls with representatives from Zillow to attempt to

11 negotiate a license.

12   92.   On August 11, 2017, IBM sent Zillow a letter informing them that they

13 were infringing several patents, including the '849 and '789 patents. On October 31,

14 2017, IBM further informed Zillow that it was infringing the '346 patent. At a meeting

15 between the parties on November 13, 2017, IBM presented detailed claim charts

16 demonstrating how Zillow was infringing the '849, '789, and '346 patents, along with

17 several others patents.

18   93.   IBM informed Zillow that it was infringing the '183 and '389 patents on

19 January 14, 2019. At that time, IBM also provided detailed claim charts demonstrating

20 how Zillow was infringing those patents. Then, on August 26, 2019, IBM informed

21 Zillow that it was infringing the '904 and '443 patents and again provided detailed claim

22 charts demonstrating their infringement. Finally, on November 25, 2019, IBM provided

23 additional evidence of Zillow's infringement of the '183 patent, including an additional

24 detailed claim chart demonstrating this infringement.

25   94.   IBM has repeatedly attempted to reach a negotiated solution to Zillow's

26 infringement of the Patents-in-Suit and has presented detailed examples of their

27 infringement of each of the Patents-in-Suit. But Zillow has refused to engage in any

28 meaningful discussions about reaching a license agreement to end their infringement of

1   IBM's patents. Instead, Zillow has continued to willfully infringe IBM's patents so as

2   to obtain the significant benefits of IBM's innovations without paying any

3   compensation to IBM.

4   95.   Because IBM's over three-year struggle to negotiate a license agreement

5   that remedies Zillow's unlawful conduct has failed, IBM has been forced to seek relief

6   through litigation. Among other relief sought, IBM seeks royalties on the billions of

7   dollars in revenue that Zillow has received based on their infringement of IBM's

8   patented technology.

9   **COUNT ONE**

10   **INFRINGEMENT OF THE '849 PATENT**

11   96.   IBM incorporates by reference paragraphs 1-95.

12   97.   IBM is the owner of all right, title and interest in the '849 patent. The '849

13 patent was duly and properly issued by the USPTO on July 4, 2006. The '849 patent

14 was duly assigned to IBM. A copy of the '849 patent is attached hereto as Exhibit 42.

15   98.   The '849 patent is valid and enforceable.

16   99.   In violation of 35 U.S.C. § 271, Zillow has infringed, contributed to the

17 infringement of, and/or induced others to infringe one or more of the claims of the '849

18 patent by having made, designed, offered for sale, sold, provided, used, maintained,

19 and/or supported their website, including at least www.zillow.com,

20 www.zillowgroupmedia.com, and subdomains thereof, and the associated mobile

21 applications, including the Zillow applications for mobile devices running on, for

22 example, the Apple iOS and Google Android operating systems, including at least

23 Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications.

24 Zillow's infringement is continuing.

25   100. Zillow Group "operates the largest portfolio of real estate and home-

26 related brands on mobile and the web which focus on all stages of the home lifecycle:

27 renting, buying, selling and financing. . . . The Zillow Group portfolio of consumer

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1   brands includes Zillow . . . ."[45]   Zillow Group's "technology solutions" and actions

2   related to such technology infringe, direct or control infringement, induce infringement,

3   and/or contribute to the infringement through Zillow's website and through the mobile

4   application instrumentalities.

5   101.   Zillow, Inc. owns and operates the Zillow website, including at least

6   www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and the

7   Zillow mobile applications on, for example, the iOS and Android operating systems.

8   Zillow, Inc. provides online real estate listings and related services to consumers and

9   local real estate agents through the website and mobile application instrumentalities.

10   102.   Zillow Group and Zillow, Inc. directly infringe one or more claims of the

11   '849 patent through the Zillow website and the Zillow mobile applications, as described

12   below. Additionally, Zillow Group directs and controls the infringing behavior of its

13   agent, Zillow, Inc., which Zillow Group operates and wholly owns.

14   103.   For example, as shown in Exhibit 43, the Zillow website and Zillow mobile

15   applications infringe at least claim 1 of the '849 patent at least by:

16   a.   presenting advertising obtained from a computer network, the

17   network including a multiplicity of user reception systems at which respective users can

18   request applications, from the network, that include interactive services, the respective

19   reception systems including a monitor at which at least the visual portion of the

20   applications can be presented as one or more screens of display, the method comprising

21   the steps of:

22   b.   structuring applications so that they may be presented, through the

23   network, at a first portion of one or more screens of display; and:
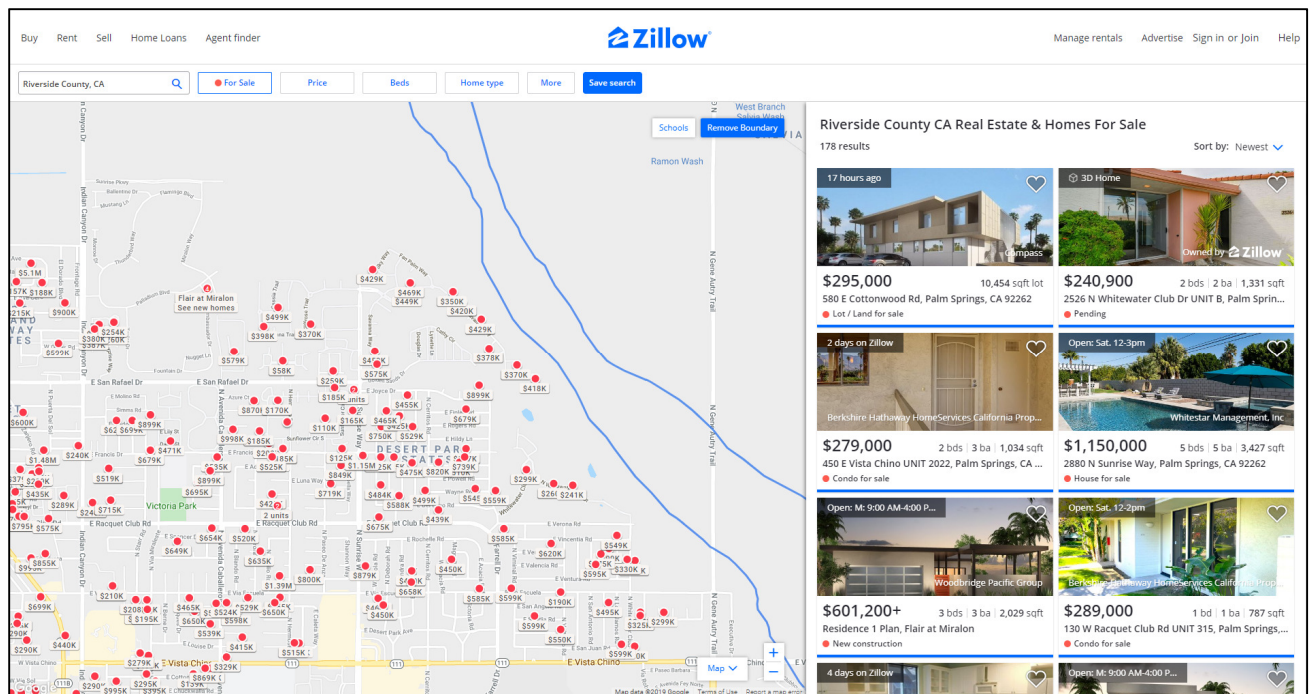
24   c.   structuring advertising in a manner compatible to that of the

25   applications so that it may be presented, through the network, at a second portion of one

26   or more screens of display concurrently with applications, wherein structuring the

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[45] Ex. 4 (Zillow Group 2018 10-K) at 3.

1 advertising includes configuring the advertising as objects that include advertising data

2 and;

3   d.   selectively storing advertising objects at a store established at the

4 reception system.

5   104. For another example, Zillow Group and Zillow, Inc. infringe at least claim

6 1 of the '849 patent through Zillow's website and mobile applications in a similar

7 manner to that shown in Exhibit 43, at least when the advertising is from, or involves,

8 Zillow Group Media; when the advertising is for properties Zillow owns through Zillow

9 Offers; and when the advertising is for other advertised properties, such as Promoted

10 Communities for new constructions, properties managed by or associated with Premier

11 Agent, and other properties promoted using Zillow's advertising services.

12

Ex. 44 (Zillow search in Riverside County, CA).

Ex. 45 (https://www.zillow.com/resources/new-construction/training/inline-community-preview/).

Ex. 46 (https://www.zillow.com/marketing/rental-property-advertising/).

105.   For another example, Zillow Group and Zillow, Inc. infringe at least claim 1 of the '849 patent through the Zillow Group Media service in at least a similar manner to that shown in Ex. 43:

Ad Products

Reach coveted audiences by featuring your brand in native placements across Zillow Group brands and devices. Integrate your message into the user experience with ad products that are perfectly formatted for every device to achieve outstanding performance results.

Ex. 47 (https://www.zillowgroupmedia.com/native-ads/).

106.   Zillow Group and Zillow, Inc. infringe at least claim 1 of the '849 patent through the Zillow mobile applications, including at least the iOS and Android Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications, in a similar manner as through the website.

107.   Alternatively, to the extent that any step of claim 1 of the '849 patent, including the "structuring" or "selectively storing" steps, are performed by a third party (in addition to and/or separate from Zillow's performance), such as a user, browser, or mobile operating system, that performance is attributable to Zillow, Inc. and Zillow Group at least because each Zillow entity has an agency and/or contractual relationship with said third party and each Zillow entity controls and/or directs the performance of said third party.   For example, each Zillow entity controls and/or directs the performance of the "selectively storing" step by users, browsers, and mobile operating systems because it, for example, conditions receipt of a benefit, such as reduced latency, on the performance of the claimed steps, and establishes the manner or timing of the performance by, for example, determining what image and other data is cached and for how long.   For another example, each Zillow entity controls and/or directs the performance of the "selectively storing" step by users, browsers, and mobile operating systems because it profits from the performance by, for example, increasing use and user interactions from reduced latency, and each Zillow entity has the right to stop or limit infringement, by, for example, determining that image and other data is not cached.

1   108.   Alternatively, to the extent that any step of claim 1 of the '849 patent,
2 including the "structuring" or "selectively storing" steps, are performed by a third party
3 (in addition to and/or separate from Zillow's performance), such as a Content Delivery
4 Network ("CDN") or other server, including Amazon CloudFront, that performance is
5 attributable to Zillow, Inc. and Zillow Group at least because each Zillow entity has an
6 agency and/or contractual relationship with said third party and each Zillow entity
7 controls and/or directs the performance of said third party. For example, each Zillow
8 entity controls and/or directs the performance of the "selectively storing" step by CDNs
9 because it, for example, conditions receipt of a benefit, such as payment for services,
10 on the performance of the claimed steps, and establishes the manner or timing of the
11 performance by, for example, determining what image and other data is cached and for
12 how long.   For another example, each Zillow entity controls and/or directs the
13 performance of the "selectively storing" step by CDNs because it profits from the
14 performance by, for example, increasing use and user interactions from reduced latency,
15 and each Zillow entity has the right to stop or limit infringement, by, for example,
16 determining that image and other data is not cached.

17   109.   Zillow Group and Zillow, Inc. have had knowledge of the '849 patent and
18 their alleged direct and indirect infringement since August 11, 2017.

19   110.   Zillow Group and Zillow, Inc. also indirectly infringe one or more claims
20 of the '849 patent through the Zillow website, including at least www.zillow.com,
21 www.zillowgroupmedia.com, and subdomains thereof, and the Zillow mobile
22 applications. On information and belief, in certain circumstances, client devices and
23 software (e.g., devices and software used by end users and customers of Zillow's
24 website and the associated mobile applications) directly infringe the '849 patent through
25 the use of the website and mobile applications to view at least real estate listings. Zillow
26 Group's Annual Report lists $1,333,554,000 of revenue from its website and mobile
27 applications which "generate revenue from the sale of advertising services and our suite

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1 of marketing software and technology solutions."[46]   The revenue indicates that

2 numerous end users and customers used Zillow's website and the associated mobile

3 applications in order to view real estate listings and thereby infringe the '849 patent. In

4 particular, to the extent Zillow does not perform the method steps, in certain

5 circumstances, client devices and software (e.g., devices and software used by end users

6 and customers of Zillow's website and the associated mobile applications) perform at

7 least the method of presenting advertising recited by claim 1 of the '849 patent as shown

8 in Exhibit 43.

9   111.   On information and belief, despite knowledge of the infringement of the

10 '849 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

11 contribute to patent infringement by third parties by selling, offering to sell, and/or

12 supplying components, and/or a material or apparatus for use in practicing the patented

13 methods of the '849 patent by at least end users and consumers, as described in this

14 section.

15   112. For example Zillow Group and Zillow Inc. provide computer code

16 underlying the Zillow website and mobile applications, such as HTML, JavaScript, and

17 image files, to customers and end users for use in infringing the '849 patent and such

18 computer code does not have substantial non-infringing uses. Such computer code is

19 especially made and/or especially adapted for use in infringing the '849 patent and is

20 not a staple article or commodity of commerce suitable for substantial non-infringing

21 use. The only substantial use of Zillow's computer code responses is for the claimed

22 subject matter involving presenting applications and advertisements in an interactive

23 service as described in the '849 patent.

24   113. Further, on information and belief, as a part of providing said computer

25 code, Zillow Group and Zillow, Inc. enter into binding contracts with end users and

26 customers to use Zillow's website and mobile applications, including in an infringing

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[46] Ex. 4 (Zillow Group 2018 10-K) at 3, 42.

manner including by binding the users to a terms of use for the accused website and mobile applications. On information and belief, Zillow Group and Zillow, Inc. receive valuable consideration from customers and end users located in this judicial district, including information provided by customers and end users, and/or information automatically collected from customers and end users. When customers and end users in this judicial district use the accused website and/or mobile applications, Zillow Group and Zillow, Inc. collect information about the customers and end users, their devices, and their interaction with the accused website and the associated mobile applications. Zillow Group and Zillow, Inc. work with service providers and advertising networks to track and manage cookie information and activities of customers and end users across different websites and devices. Third parties use cookie information collected by Zillow Group and Zillow, Inc. to deliver advertisements to end users and customers based on their use of the accused website and mobile applications. Zillow Group and Zillow, Inc.'s business is primarily funded through advertising. The application and website are especially made and/or especially adapted for use in infringing the Patents-in-Suit, at least as detailed in the individual Counts above, and are not a staple article or commodity of commerce suitable for substantial non-infringing uses because, among other things, the components sent to users are uniquely designed only to access the infringing aspects of Zillow's website and mobile applications.

114. On information and belief, despite their knowledge of the infringement of the '849 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to induce patent infringement by third parties, including at least the direct infringement by end users and customer, as described in this section. Zillow has encouraged and instructed and continues to encourage and instruct customers and end users to use Zillow's website and the associated mobile applications in a manner that infringes the '849 patent by advertising the website and mobile applications, providing customer support, and designing their website and mobile applications in such a way that the use

1   of the website and mobile applications by an end user or customer infringes the '849

2   patent.

3   115.   For example, Zillow has encouraged and instructed and continues to

4   encourage and instruct customers and end users to use Zillow's website and the

5   associated mobile applications in an infringing manner by providing customer support

6   from their Irvine office in this district, and designing their website and mobile

7   applications in such a way that the use of the website and mobile applications by an end

8   user or customer infringes the Patents-in-Suit. For example, "the technology developed

9   in Zillow's Irvine office concerns . . . customer service," including, on information and

10   belief, customer service to encourage and support customers and end users in their use

11   of Zillow's website and the associated mobile applications in an infringing manner.[47]

12   For another example, https://zillow.zendesk.com/hc/en-us provides direction and

13   support for Zillow's website. On information and belief, to the extent Zillow was not

14   aware that they were encouraging their customers and end users to infringe the '849

15   patent, its lack of knowledge was based on being willfully blind to the possibility that

16   their acts would cause infringement.

17   116.   IBM has been damaged by the infringement of its '849 patent by Zillow

18   and will continue to be damaged by such infringement. IBM is entitled to recover from

19   Zillow the damages sustained by IBM as a result of Zillow's wrongful acts.

20   117.   The infringement by Zillow of the '849 patent was, and continues to be,

21   deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and

22   to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285. In

23   committing these acts of infringement, Zillow actually knew or should have known that

24   their actions constituted an unjustifiably high risk of infringement of a valid and

25   enforceable patent.

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[47] Moch Decl. ¶ 11.

1   118.   IBM has suffered and continues to suffer irreparable harm, for which there

2   is no adequate remedy at law, and will continue to do so unless Zillow is enjoined

3   therefrom by this Court. In committing these acts of infringement, Zillow actually knew

4   or should have known that its actions constituted an unjustifiably high risk of

5   infringement of a valid and enforceable patent.

COUNT TWO

INFRINGEMENT OF THE '346 PATENT

8   119.   IBM incorporates by reference paragraphs 1-118.

9   120.   IBM is the owner of all right, title and interest in the '346 patent. The '346

10   patent was duly and properly issued by the USPTO on December 8, 2009. The '346

11   patent was duly assigned to IBM. A copy of the '346 patent is attached hereto as Exhibit

12   48.

13   121.   The '346 patent is valid and enforceable.

14   122.   In violation of 35 U.S.C. § 271, Zillow has infringed one or more of the

15   claims of the '346 patent by having made, designed, offered for sale, sold, provided,

16   used, maintained, and/or supported their website, including at least www.zillow.com,

17   www.zillowgroupmedia.com, and subdomains thereof, and the associated mobile

18   applications, including the Zillow applications for mobile devices running on, for

19   example, the Apple iOS and Google Android operating systems, including at least

20   Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications.

21   Zillow's infringement is continuing.

22   123.   Zillow Group "operates the largest portfolio of real estate and home-

23   related brands on mobile and the web which focus on all stages of the home lifecycle:

24   renting, buying, selling and financing. . . . The Zillow Group portfolio of consumer

25   brands includes Zillow . . . ."[48] Zillow Group's "technology solutions" and actions

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[48] Ex. 4 (Zillow Group 2018 10-K) at 3.

1 related to such technology infringe and/or direct or control infringement through

2 Zillow's website and through the mobile application instrumentalities.

3   124. Zillow, Inc. owns and operates the Zillow website, including at least

4 www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and the

5 Zillow mobile applications on, for example, the iOS and Android operating systems.

6 Zillow, Inc. provides online real estate listings and related services to consumers and

7 local real estate agents through the website and mobile application instrumentalities.

8   125. Zillow Group and Zillow, Inc. directly infringe one or more claims of the

9 '346 patent through the Zillow website and the Zillow mobile applications, as described

10 below. Additionally, Zillow Group directs and controls the infringing behavior of its

11 agent, Zillow, Inc., which Zillow Group operates and wholly owns.

12   126. For example, as shown in Exhibit 49, the Zillow website and Zillow mobile

13 applications infringe at least claim 1 of the '346 patent at least by:

14   a.   managing user authentication within a distributed data processing

15 system, wherein a first system and a second system interact within a federated

16 computing environment and support single-sign-on operations in order to provide

17 access to protected resources, at least one of the first system and the second system

18 comprising a processor, the method comprising:

19   b.   triggering a single-sign-on operation on behalf of the user in order

20 to obtain access to a protected resource that is hosted by the second system, wherein the

21 second system requires a user account for the user to complete the single-sign-on

22 operation prior to providing access to the protected resource;

23   c.   receiving from the first system at the second system an identifier

24 associated with the user; and

25   d.   creating a user account for the user at the second system based at

26 least in part on the received identifier associated with the user after triggering the single-

27 sign-on operation but before generating at the second system a response for accessing

28 the protected resource, wherein the created user account supports single-sign-on

1   operations between the first system and the second system on behalf of the user.

2   127.   The Zillow mobile applications, including at least the Zillow Real Estate

3   & Rentals and the Zillow Rentals applications, infringe at least claim 1 of the '346

4   patent in a similar manner as through the website.

5   128.   Alternatively, to the extent that any step of claim 1 of the '346 patent,

6   including the "triggering" step, is performed by a third party (in addition to and/or

7   separate from Zillow's performance), such as a user, browser, or mobile operating

8   system, that performance is attributable to Zillow, Inc. and Zillow Group at least

9   because each Zillow entity has an agency and/or contractual relationship with said third

10   party and each Zillow entity controls and/or directs the performance of said third party.

11   For example, each Zillow entity controls and/or directs the performance of the

12   "triggering" step by users, browsers, and mobile operating systems because it, for

13   example, conditions receipt of a benefit, such as access to certain applications on

14   Zillow's website and mobile applications, on the performance of the claimed steps, and

15   establishes the manner or timing of the performance by, for example, triggering the

16   single-sign-on operation using its underlying computer code.   For another example,

17   each Zillow entity controls and/or directs the performance of the "triggering" step by

18   users, browsers, and mobile operating systems because it profits from the performance

19   by, for example, increasing the number of signed-in users accessing Zillow's website

20   and mobile applications, and each Zillow entity has the right to stop or limit

21   infringement, by, for example, not enabling the use of single-sign-on operations or

22   account creation.

23   129.   Zillow Group and Zillow, Inc. have had knowledge of the '346 patent and

24   their alleged direct and indirect infringement since October 31, 2017.

25   130.   IBM has been damaged by the infringement of its '346 patent by Zillow

26   and will continue to be damaged by such infringement.   IBM is entitled to recover from

27   Zillow the damages sustained by IBM as a result of Zillow's wrongful acts.

28

1   131.   The infringement by Zillow of the '346 patent was, and continues to be,

2 deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and

3 to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285. In

4 committing these acts of infringement, Zillow actually knew or should have known that

5 its actions constituted an unjustifiably high risk of infringement of a valid and

6 enforceable patent.

7   132.   IBM has suffered and continues to suffer irreparable harm, for which there

8 is no adequate remedy at law, and will continue to do so unless Zillow is enjoined

9 therefrom by this Court. In committing these acts of infringement, Zillow actually knew

10 or should have known that their actions constituted an unjustifiably high risk of

11 infringement of a valid and enforceable patent.

COUNT THREE

INFRINGEMENT OF THE '183 PATENT

14   133.   IBM incorporates by reference paragraphs 1-132.

15   134.   IBM is the owner of all right, title and interest in the '183 patent. The '183

16 patent was duly and properly issued by the USPTO on January 26, 2016. The '183

17 patent was duly assigned to IBM. A copy of the '183 patent is attached hereto as Exhibit

18 50.

19   135.   The '183 patent is valid and enforceable.

20   136.   In violation of 35 U.S.C. § 271, Zillow has infringed, contributed to the

21 infringement of, and/or induced others to infringe one or more of the claims of the '183

22 patent by having made, designed, offered for sale, sold, provided, used, maintained,

23 and/or   supported   their   website,   including   at   least   www.zillow.com,

24 www.zillowgroupmedia.com, and subdomains thereof, and the associated mobile

25 applications, including the Zillow applications for mobile devices running on, for

26 example, the Apple iOS and Google Android operating systems, including at least

27 Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications.

28 Zillow's infringement is continuing.

137.   Zillow Group "operates the largest portfolio of real estate and home-related brands on mobile and the web which focus on all stages of the home lifecycle: renting, buying, selling and financing. . . .   The Zillow Group portfolio of consumer brands includes Zillow . . . ."[49]   Zillow Group's "technology solutions" and actions related to such technology infringe, direct or control infringement, induce infringement, and/or contribute to the infringement through Zillow's website and through the mobile application instrumentalities.

138.   Zillow, Inc. owns and operates the Zillow website, including at least www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and the Zillow mobile applications on, for example, the iOS and Android operating systems. Zillow, Inc. provides online real estate listings and related services to consumers and local real estate agents through the website and mobile application instrumentalities.

139.   Zillow Group and Zillow, Inc. directly infringe one or more claims of the '183 patent through the Zillow website and the Zillow mobile applications, as described below. Additionally, Zillow Group directs and controls the infringing behavior of its agent, Zillow, Inc., which Zillow Group operates and wholly owns.

140.   For example, as shown in Exhibit 51, the Zillow website and Zillow mobile applications infringe at least claim 1 of the '183 patent at least by:

  a. retrieving in real time, by a computer processor of a computing system, image data associated with a plurality of locations within a specified geographical area;

  b. comparing, by said computer processor, said image data to a plurality of stored image data, wherein said plurality of stored image data comprise baseline measurement values associated with an expected condition level of baseline locations within a baseline geographical area;

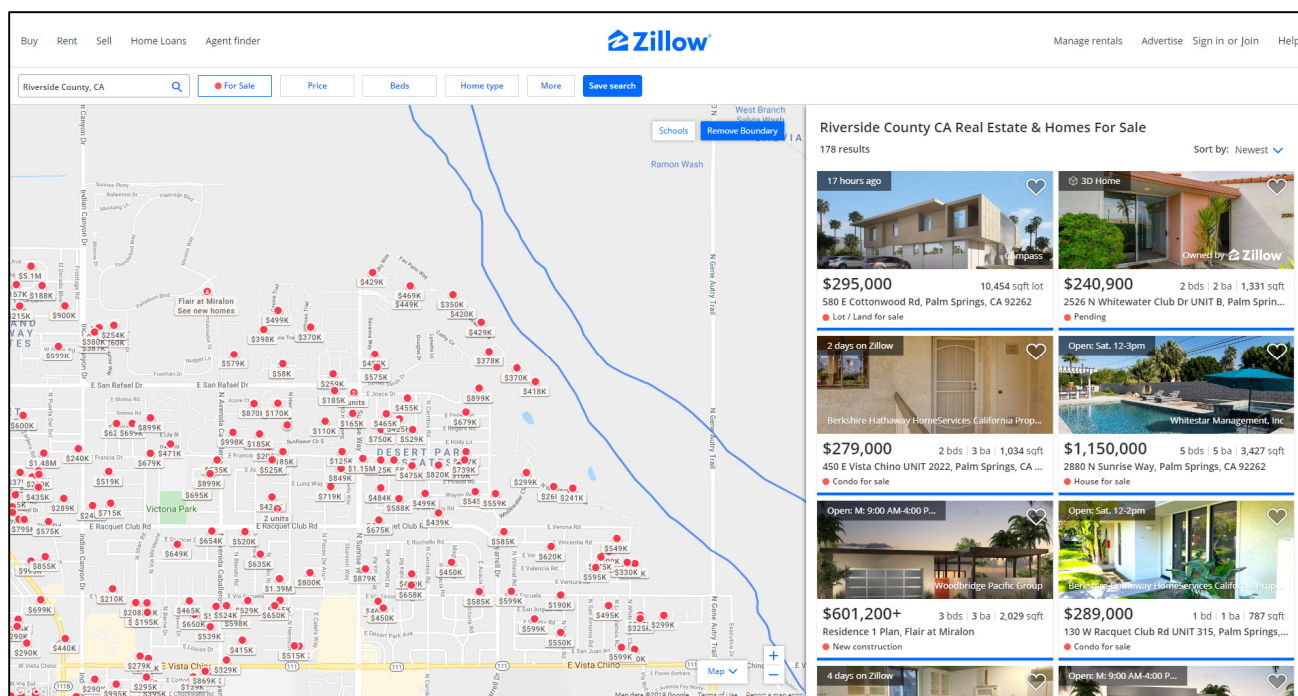 c. calculating, by said computer processor based on results of said

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[49] Ex. 4 (Zillow Group 2018 10-K) at 3.

1   comparing, condition score values associated with said plurality of locations, wherein

2   said condition score values indicate real time condition values associated with said

3   plurality of locations;

4   d.   calculating, by said computer processor based on said condition

5   score values, an overall condition score value associated with said specified

6   geographical area; and

7   e.   generating, by said computer processor, a map indicating said

8   overall condition score value associated with said specified geographical area.

9   141. For another example, Zillow Group and Zillow, Inc. infringe at least claim

10   1 of the '183 patent through Zillow's website and mobile applications in a similar

11   manner to that shown in Exhibit 51 at least when the properties are from, or involve,

12   Zillow Group Media; when the properties are properties Zillow owns through Zillow

13   Offers; and when the properties are, for example, properties from Promoted

14   Communities for new constructions, properties managed by or associated with Premier

15   Agent, and other properties promoted using Zillow's advertising services.
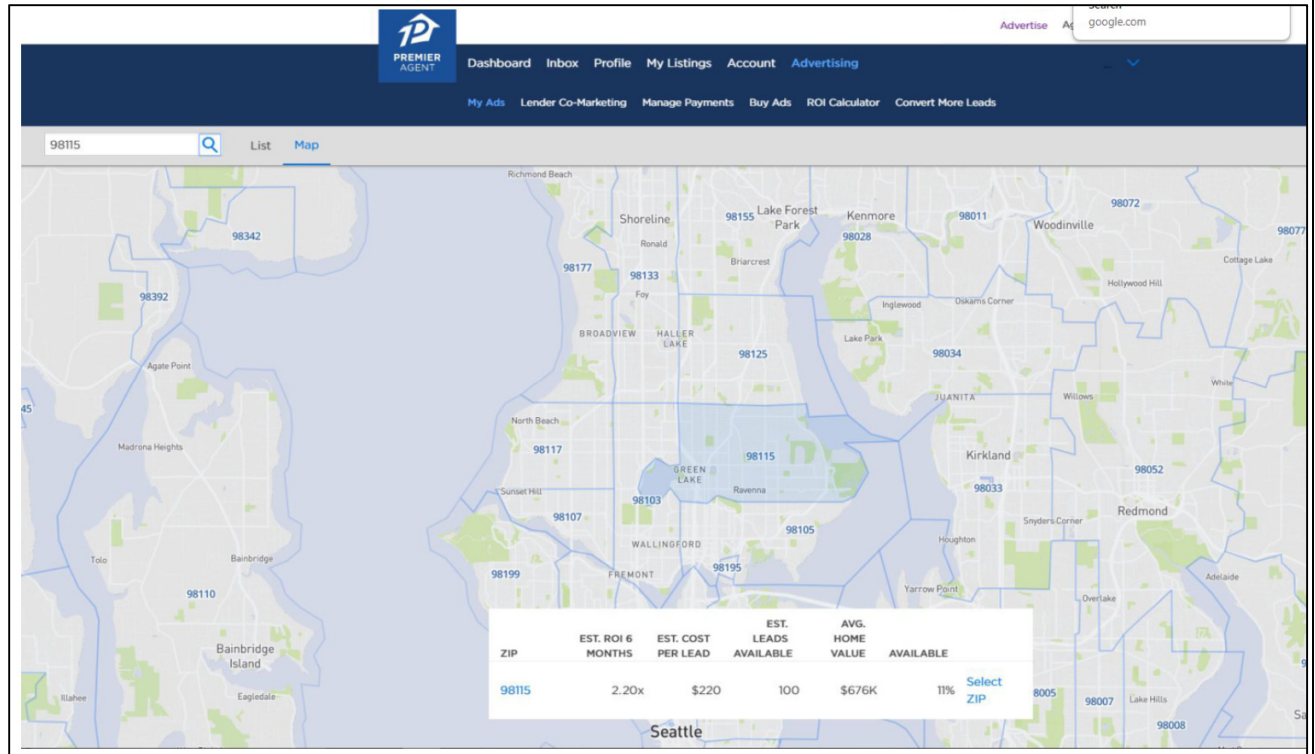
16

Ex. 44 (Zillow search in Riverside County, CA).

Ex. 45 (https://www.zillow.com/resources/new-construction/training/inline-community-preview/).

142.   For another example, Zillow Group and Zillow, Inc. infringe at least claim 1 of the '183 patent through the Premier Agent service in at least a similar manner to that shown in Ex. 51:

Ex. 52 (https://www.zillow.com/agent-resources/training/manage-premier-agent-advertising/manage-your-advertising-on-zillow/).

Ex. 52 (https://www.zillow.com/agent-resources/training/manage-premier-agent-advertising/manage-your-advertising-on-zillow/).

143.   The Zillow mobile applications, including at least the Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications, infringe at least claim 1 of the '183 patent in a similar manner as through the website.

144.   Alternatively, to the extent that any step of claim 1 of the '183 patent, including the "generating" step, is performed by a third party (in addition to and/or separate from Zillow's performance), such as a user, browser, or mobile operating system, that performance is attributable to Zillow, Inc. and Zillow Group at least because each Zillow entity has an agency and/or contractual relationship with said third party and each Zillow entity controls and/or directs the performance of said third party. For example, each Zillow entity controls and/or directs the performance of the "generating" step by users, browsers, and mobile operating systems because it, for example, conditions receipt of a benefit, such as viewing accurate home and neighborhood value estimates, on the performance of the claimed steps, and establishes

1 the manner or timing of the performance by, for example, determining the method by

2 which the Zestimate and ZHVI is calculated and the map is generated using computer

3 code, such as HTML and JavaScript. For another example, each Zillow entity controls

4 and/or directs the performance of the "generating" step by users, browsers, and mobile

5 operating systems because it profits from the performance by, for example, increasing

6 the number of users through updated home and neighborhood valuations, and each

7 Zillow entity has the right to stop or limit infringement, by, for example, removing this

8 image processing feature from the Zestimate feature or not providing computer code to

9 generate the map.

10   145.   Alternatively, to the extent any step of claim 1 of the '183 patent, including

11 the "generating" step, is performed by a third party (in addition to and/or separate from

12 Zillow's performance), such as a Content Delivery Network ("CDN") or other server,

13 including Amazon CloudFront, that performance is attributable to Zillow, Inc. and

14 Zillow Group at least because each Zillow entity has an agency and/or contractual

15 relationship with said third party and each Zillow entity controls and/or directs the

16 performance of said third party. For example, each Zillow entity controls and/or directs

17 the performance of the "generating" step by CDNs because it, for example, conditions

18 receipt of a benefit, such as payment for services, on the performance of the claimed

19 steps, and establishes the manner or timing of the performance by, for example,

20 determining the method by which the Zestimate and ZHVI is calculated and the map is

21 generated using computer code, such as HTML and JavaScript. For another example,

22 each Zillow entity controls and/or directs the performance of the "generating" step by

23 CDNs because it profits from the performance by, for example, increasing the number

24 of users through updated home and neighborhood valuations, and each Zillow entity

25 has the right to stop or limit infringement, by, for example, removing this image

26 processing feature from the Zestimate feature or not providing computer code to

27 generate the map.

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1   146.   Zillow Group and Zillow, Inc. have had knowledge of the '183 patent and

2   their alleged direct and indirect infringement since January 14, 2019.

3   147.   Zillow Group and Zillow, Inc. also indirectly infringe one or more claims

4   of the '183 patent through the Zillow website, including at least www.zillow.com,

5   www.zillowgroupmedia.com, and subdomains thereof, and the Zillow mobile

6   applications. On information and belief, in certain circumstances, client devices and

7   software (e.g., devices and software used by end users and customers of Zillow's

8   website and the associated mobile applications) directly infringe the '183 patent through

9   the use of the website and mobile applications to view at least real estate listings,

10   Zestimates, and Zillow Home Value Indexes. Zillow Group's Annual Report lists

11   $1,333,554,000 of revenue from its website and mobile applications which "generate

12   revenue from the sale of advertising services and our suite of marketing software and

13   technology solutions."[50] The revenue indicates that numerous end users and customers

14   used Zillow's website and the associated mobile application in order to view real estate

15   listings, Zestimates, and ZHVI values and thereby infringe the '183 patent.   In

16   particular, to the extent Zillow does not perform the method steps, in certain

17   circumstances, client devices and software (e.g., devices and software used by end users

18   and customers of Zillow's website and the associated mobile applications) perform at

19   least the method of calculating geographical condition score values recited by claim 1

20   of the '183 patent as shown in Exhibit 51.

21   148.   On information and belief, despite knowledge of the infringement of the

22   '183 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

23   contribute to patent infringement by third parties by selling, offering to sell, and/or

24   supplying components, and/or a material or apparatus for use in practicing the patented

25   methods of the '183 patent by at least end users and consumers, as described in this

26   section.

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[50] Ex. 4 (Zillow Group 2018 10-K) at 3, 42.

149. For example Zillow Group and Zillow Inc. provide computer code underlying the Zillow website and mobile applications, such as HTML, JavaScript, and image files, to customers and end users for use in infringing the '183 patent and such computer code does not have substantial non-infringing uses. Such computer code is especially made and/or especially adapted for use in infringing the '183 patent and is not a staple article or commodity of commerce suitable for substantial non-infringing use. The only substantial use of Zillow's computer code responses is for the claimed subject matter involving calculating geographical condition score values using image data as described in the '183 patent.

150. Further, on information and belief, as a part of providing said computer code, Zillow Group and Zillow, Inc. enter into binding contracts with end users and customers to use Zillow's website and mobile applications, including in an infringing manner including by binding the users to a terms of use for the accused website and mobile applications. On information and belief, Zillow Group and Zillow, Inc. receive valuable consideration from customers and end users located in this judicial district, including information provided by customers and end users, and/or information automatically collected from customers and end users. When customers and end users in this judicial district use the accused website and/or mobile applications, Zillow Group and Zillow, Inc. collect information about the customers and end users, their devices, and their interaction with the accused website and the associated mobile application. Zillow Group and Zillow, Inc. work with service providers and advertising networks to track and manage cookie information and activities of customers and end users across different websites and devices. Third parties use cookie information collected by Zillow Group and Zillow, Inc. to deliver advertisements to end users and customers based on their use of the accused website and mobile applications. Zillow Group and Zillow, Inc.'s business is primarily funded through advertising. The applications and website are especially made and/or especially adapted for use in infringing the Patents-in-Suit, at least as detailed in the individual Counts above, and are not a staple article or

1   commodity of commerce suitable for substantial non-infringing uses because, among

2   other things, the components sent to users are uniquely designed only to access the

3   infringing aspects of Zillow's website and mobile applications.

4   151.   On information and belief, despite their knowledge of the infringement of

5   the '183 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

6   induce patent infringement by third parties, including at least the direct infringement by

7   end users and customer, as described in this section.   Zillow has and continues to

8   encourage and instruct customers and end users to use Zillow's website and the

9   associated mobile applications in a manner that infringes the '183 patent by advertising

10 the website and mobile applications, providing customer support, and designing their

11 website and mobile applications in such a way that the use of the website and mobile

12 applications by an end user or customer infringes the '183 patent.

13   152.   For example, Zillow has encouraged and continues to encourage and

14 instruct customers and end users to use Zillow's website and the associated mobile

15 applications in an infringing manner by providing customer support from their Irvine

16 office in this district, and designing their website and mobile applications in such a way

17 that the use of the website and mobile applications by an end user or customer infringes

18 the Patents-in-Suit.   For example, "the technology developed in Zillow's Irvine office

19 concerns . . . customer service," including, on information and belief, customer service

20 in support to encourage and support customers and end users in their use of Zillow's

21 website and the associated mobile applications in an infringing manner.[51]   For another

22 example, https://zillow.zendesk.com/hc/en-us provides direction and support Zillow's

23 website.   As of November 11, 2019, which is after the filing of the Complaint, Zillow

24 continues to instructs its customers and end users in this judicial district to edit, add, or

25 remove photos to influence Zestimate values in a manner that infringes at least claim 1

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28   [51] Moch Decl. ¶ 11.

1   of the '183 patent.[52] On information and belief, to the extent Zillow was not aware that

2   they were encouraging their customers and end users to infringe the '183 patent, its lack

3   of knowledge was based on being willfully blind to the possibility that their acts would

4   cause infringement.

5   153.   IBM has been damaged by the infringement of its '183 patent by Zillow

6   and will continue to be damaged by such infringement. IBM is entitled to recover from

7   Zillow the damages sustained by IBM as a result of Zillow's wrongful acts.

8   154.   The infringement by Zillow of the '183 patent was, and continues to be,

9   deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and

10   to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285. In

11   committing these acts of infringement, Zillow actually knew or should have known that

12   its actions constituted an unjustifiably high risk of infringement of a valid and

13   enforceable patent.

14   155.   IBM has suffered and continues to suffer irreparable harm, for which there

15   is no adequate remedy at law, and will continue to do so unless Zillow is enjoined

16   therefrom by this Court. In committing these acts of infringement, Zillow actually knew

17   or should have known that its actions constituted an unjustifiably high risk of

18   infringement of a valid and enforceable patent.

19   **COUNT FOUR**

20   **INFRINGEMENT OF THE '789 PATENT**

21   156.   IBM incorporates by reference paragraphs 1-155.

22   157.   IBM is the owner of all right, title and interest in the '789 patent. The '789

23   patent was duly and properly issued by the USPTO on Oct. 13, 2015. The '789 patent

24   was duly assigned to IBM. A copy of the '789 patent is attached hereto as Exhibit 56.

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26   _____

27   [52] Ex. 53 (https://zillow.zendesk.com/hc/en-us/articles/203511930-How-do-I-add-or-remove-photos-of-my-home-); Ex. 54

28   (https://www.zillow.com/sellerlanding/edityourhome/); Ex. 55
     (https://www.zillow.com/blog/zestimate-updates-230614/).

1   158.   The '789 patent is valid and enforceable.

2   159.   In violation of 35 U.S.C. § 271, Zillow has infringed, contributed to the

3   infringement of, and/or induced others to infringe one or more of the claims of the '789

4   patent by having made, designed, offered for sale, sold, provided, used, maintained,

5   and/or   supported   its   website,   including   at   least   www.zillow.com,

6   www.zillowgroupmedia.com, and subdomains thereof, and the associated mobile

7   applications, including the Zillow applications for mobile devices running on, for

8   example, the Apple iOS and Google Android operating systems, including at least

9   Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications.

10   Zillow's infringement is continuing.

11   160.   Zillow Group "operates the largest portfolio of real estate and home-

12   related brands on mobile and the web which focus on all stages of the home lifecycle:

13   renting, buying, selling and financing. . . . The Zillow Group portfolio of consumer

14   brands includes Zillow . . . ."[53]   Zillow Group's "technology solutions" and actions

15   related to such technology infringe, direct or control infringement, induce infringement,

16   and/or contribute to the infringement through Zillow's website and through the mobile

17   application instrumentalities.

18   161.   Zillow, Inc. owns and operates the Zillow website, including at least

19   www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and the

20   Zillow mobile applications on, for example, the iOS and Android operating systems.

21   Zillow, Inc. provides online real estate listings and related services to consumers and

22   local real estate agents through the website and mobile application instrumentalities.

23   162.   Zillow Group and Zillow, Inc. directly infringe one or more claims of the

24   '789 patent through the Zillow website and the Zillow mobile applications, as described

25   below. Additionally, Zillow Group directs and controls the infringing behavior of its

26   agent, Zillow, Inc., which Zillow Group operates and wholly owns.

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[53] Ex. 4 (Zillow Group 2018 10-K) at 3.

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT   77   Case No. 8:19-CV-01777

163. For example, as shown in Exhibit 57 the Zillow website and Zillow mobile applications infringe at least claim 8 of the '789 patent at least by:

a.   presenting a map display on a display device, wherein the map display comprises elements within a viewing area of the map display, wherein the elements comprise geospatial characteristics, wherein the elements comprise selected and unselected elements;

b.   presenting a list display on the display device, wherein the list display comprises a customizable list comprising the elements from the map display;

c.   receiving a user input drawing a selection area in the viewing area of the map display, wherein the selection area is a user determined shape, wherein the selection area is smaller than the viewing area of the map display, wherein the viewing area comprises elements that are visible within the map display and are outside the selection area;

d.   selecting any unselected elements within the selection area in response to the user input drawing the selection area and deselecting any selected elements outside the selection area in response to the user input drawing the selection area; and

e.   synchronizing the map display and the list display to concurrently update the selection and deselection of the elements according to the user input, the selection and deselection occurring on both the map display and the list display.

164. For another example, Zillow Group and Zillow, Inc. infringe at least claim 8 of the '789 patent through Zillow's website and mobile applications in a similar manner to that shown in Ex. 57, at least when the shown properties are from, or involve, Zillow Group Media; when the shown properties are properties Zillow owns through Zillow Offers; and when the shown properties are, for example, properties from Promoted Communities for new constructions, properties managed by or associated with Premier Agent, and other properties promoted using Zillow's advertising services.

Ex. 44 (Zillow search in Riverside County, CA).

Ex. 45 (https://www.zillow.com/resources/new-construction/training/inline-community-preview/).
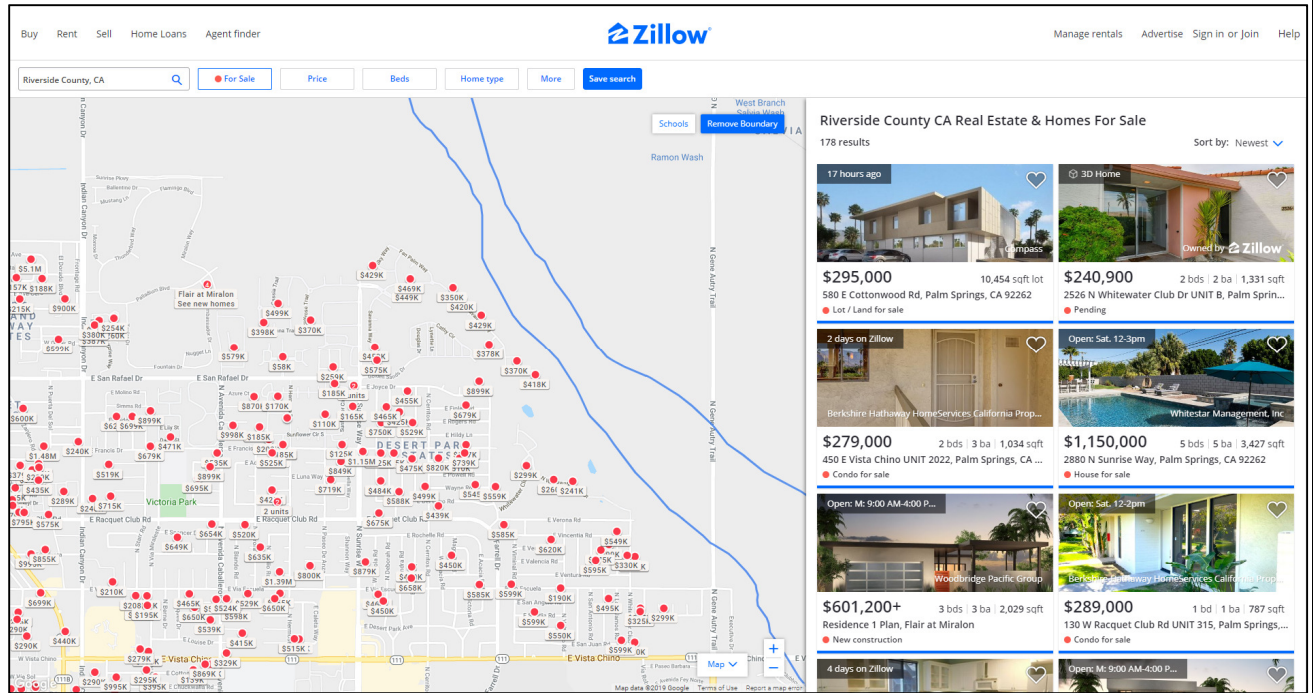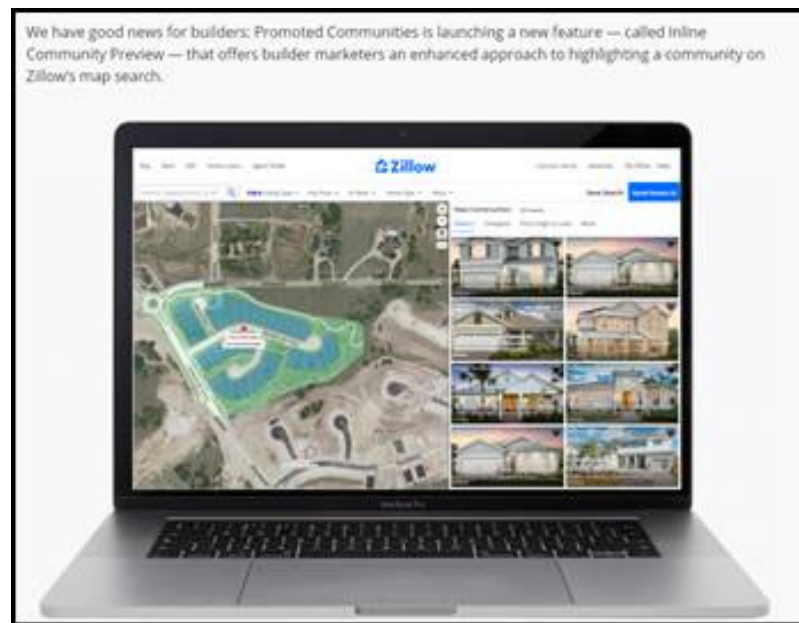
1   165.   The Zillow mobile applications, including at least the Zillow Real Estate

2 & Rentals, Zillow Rentals, and Zillow Premier Agent applications, infringe at least

3 claim 8 of the '789 patent in a similar manner as through the website.

4   166.   Alternatively, to the extent that any step of claim 8 of the '789 patent,

5 including the "receiving a user input" step, is performed by a third party (in addition to

6 and/or separate from Zillow's performance), such as a user, browser, or mobile

7 operating system, that performance is attributable to Zillow, Inc. and Zillow Group at

8 least because each Zillow entity has an agency and/or contractual relationship with said

9 third party and each Zillow entity controls and/or directs the performance of said third

10 party. For example, each Zillow entity controls and/or directs the performance of the

11 "receiving a user input" step by users, browsers, and mobile operating systems because

12 it, for example, conditions receipt of a benefit, such as selecting a specific map area to

13 search, on the performance of the claimed steps, and establishes the manner or timing

14 of the performance by, for example, providing and controlling the Draw Your Own

15 Search functionality. For another example, each Zillow entity controls and/or directs

16 the performance of the "receiving a user input" step by users, browsers, and mobile

17 operating systems because it profits from the performance by, for example, increasing

18 use and user interactions from improved search functionality, and each Zillow entity

19 has the right to stop or limit infringement, by, for example, removing the Draw Your

20 Own Search feature.

21   167.   Alternatively, to the extent any step of claim 8 of the '789 patent, including

22 the "receiving a user input" step, is performed by a third party (in addition to and/or

23 separate from Zillow's performance), such as a Content Delivery Network ("CDN") or

24 other server, including Amazon CloudFront, that performance is attributable to Zillow,

25 Inc. and Zillow Group at least because each Zillow entity has an agency and/or

26 contractual relationship with said third party and each Zillow entity controls and/or

27 directs the performance of said third party. For example, each Zillow entity controls

28 and/or directs the performance of the "receiving a user input" step by CDNs because it,

for example, conditions receipt of a benefit, such as payment for services, on the performance of the claimed steps, and establishes the manner or timing of the performance by, for example, providing and controlling the Draw Your Own Search functionality. For another example, each Zillow entity controls and/or directs the performance of the "receiving a user input" step by CDNs because it profits from the performance by, for example, increasing use and user interactions from improved search functionality, and each Zillow entity has the right to stop or limit infringement, by, for example, removing the Draw Your Own Search feature.

168.   Zillow Group and Zillow, Inc. have had knowledge of the '789 patent and their alleged direct and indirect infringement since August 11, 2017.

169.   Zillow Group and Zillow, Inc. also indirectly infringe one or more claims of the '789 patent through the Zillow website, including at least www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and the Zillow mobile applications. On information and belief, in certain circumstances, client devices and software (e.g., devices and software used by end users and customers of Zillow's website and the associated mobile applications) directly infringe the '789 patent through the use of the website and mobile applications to view at least real estate listings. Zillow Group's Annual Report lists $1,333,554,000 of revenue from its website and mobile applications which "generate revenue from the sale of advertising services and our suite of marketing software and technology solutions."[54]   The revenue indicates that numerous end users and customers used Zillow's website and the associated mobile application in order to view real estate listings and thereby infringe the '789 patent. In particular, to the extent Zillow does not perform the method steps, in certain circumstances, client devices and software (e.g., devices and software used by end users and customers of Zillow's website and the associated mobile applications) perform at

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[54] Ex. 4 (Zillow Group 2018 10-K) at 3, 42.

1 least the method of coordinated geospatial and list-based mapping recited by claim 8 of

2 the '789 patent as shown in Exhibit 57.

3   170. On information and belief, despite knowledge of the infringement of the

4 '789 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

5 contribute to patent infringement by third parties by selling, offering to sell, and/or

6 supplying components, and/or a material or apparatus for use in practicing the patented

7 methods of the '789 patent by at least end users and consumers, as described in this

8 section.

9   171. For example Zillow Group and Zillow Inc. provide computer code

10 underlying the Zillow website and mobile applications, such as HTML, JavaScript, and

11 image files, to customers and end users for use in infringing the '789 patent and such

12 computer code does not have substantial non-infringing uses. Such computer code is

13 especially made and/or especially adapted for use in infringing the '789 patent and is

14 not a staple article or commodity of commerce suitable for substantial non-infringing

15 use. The only substantial use of Zillow's computer code responses is for the claimed

16 subject matter involving coordinated geospatial and list-based mapping as described in

17 the '789 patent.

18   172. Further, on information and belief, as a part of providing said computer

19 code, Zillow Group and Zillow, Inc. enter into binding contracts with end users and

20 customers to use Zillow's website and mobile applications, including in an infringing

21 manner including by binding the users to a terms of use for the accused website and

22 mobile applications. On information and belief, Zillow Group and Zillow, Inc. receive

23 valuable consideration from customers and end users located in this judicial district,

24 including information provided by customers and end users, and/or information

25 automatically collected from customers and end users. When customers and end users

26 in this judicial district use the accused website and/or mobile applications, Zillow Group

27 and Zillow, Inc. collect information about the customers and end users, their devices,

28 and their interaction with the accused website and the associated mobile applications.

1   Zillow Group and Zillow, Inc. work with service providers and advertising networks to

2   track and manage cookie information and activities of customers and end users across

3   different websites and devices. Third parties use cookie information collected by Zillow

4   Group and Zillow, Inc. to deliver advertisements to end users and customers based on

5   their use of the accused website and mobile applications. Zillow Group and Zillow,

6   Inc.'s business is primarily funded through advertising. The applications and website

7   are especially made and/or especially adapted for use in infringing the Patents-in-Suit,

8   at least as detailed in the individual Counts above, and are not a staple article or

9   commodity of commerce suitable for substantial non-infringing uses because, among

10 other things, the components sent to users are uniquely designed only to access the

11 infringing aspects of Zillow's website and mobile applications.

12   173.   On information and belief, despite their knowledge of the infringement of

13 the '789 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

14 induce patent infringement by third parties, including at least the direct infringement by

15 end users and customer, as described in this section. Zillow has and continues to

16 encourage and instruct customers and end users to use Zillow's website and the

17 associated mobile applications in a manner that infringes the '789 patent by advertising

18 the website and mobile applications, providing customer support, and designing their

19 website and mobile applications in such a way that the use of the website and mobile

20 applications by an end user or customer infringes the '789 patent.

21   174.   For example, Zillow has encouraged and continues to encourage and

22 instruct customers and end users to use Zillow's website and the associated mobile

23 applications in an infringing manner by providing customer support from their Irvine

24 office in this district, and designing their website and mobile applications in such a way

25 that the use of the website and mobile applications by an end user or customer infringes

26 the Patents-in-Suit. For example, "the technology developed in Zillow's Irvine office

27 concerns . . . customer service," including, on information and belief, customer service

28 in support to encourage and support customers and end users in their use of Zillow's

1 website and the associated mobile applications in an infringing manner.[55] For another

2 example, https://zillow.zendesk.com/hc/en-us provides direction and support for

3 Zillow's website. On information and belief, to the extent Zillow was not aware that

4 they were encouraging their customers and end users to infringe the '789 patent, its lack

5 of knowledge was based on being willfully blind to the possibility that their acts would

6 cause infringement.

7   175. IBM has been damaged by the infringement of its '789 patent by Zillow

8 and will continue to be damaged by such infringement. IBM is entitled to recover from

9 Zillow the damages sustained by IBM as a result of Zillow's wrongful acts.

10   176. The infringement by Zillow of the '789 patent was, and continues to be,

11 deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and

12 to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285. In

13 committing these acts of infringement, Zillow actually knew or should have known that

14 its actions constituted an unjustifiably high risk of infringement of a valid and

15 enforceable patent.

16   177. IBM has suffered and continues to suffer irreparable harm, for which there

17 is no adequate remedy at law, and will continue to do so unless Zillow is enjoined

18 therefrom by this Court. In committing these acts of infringement, Zillow actually knew

19 or should have known that their actions constituted an unjustifiably high risk of

20 infringement of a valid and enforceable patent.

21   **COUNT FIVE**

22   **INFRINGEMENT OF THE '389 PATENT**

23   178. IBM incorporates by reference paragraphs 1-177.

24   179. IBM is the owner of all right, title and interest in the '389 patent. The '389

25 patent was duly and properly issued by the USPTO on March 6, 2007. The '389 patent

26 was duly assigned to IBM. A copy of the '389 patent is attached hereto as Exhibit 58.

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[55] Moch Decl. ¶ 11.

1   180.   The '389 patent is valid and enforceable.

2   181.   In violation of 35 U.S.C. § 271, Zillow has infringed, contributed to the

3   infringement of, and/or induced others to infringe one or more of the claims of the '389

4   patent by having made, designed, offered for sale, sold, provided, used, maintained,

5   and/or   supported   their   website,   including   at   least   www.zillow.com,

6   www.zillowgroupmedia.com, and subdomains thereof, and the associated mobile

7   applications, including the Zillow applications for mobile devices running on, for

8   example, the Apple iOS and Google Android operating systems, including at least

9   Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications.

10   Zillow's infringement is continuing.

11   182.   Zillow Group "operates the largest portfolio of real estate and home-

12   related brands on mobile and the web which focus on all stages of the home lifecycle:

13   renting, buying, selling and financing. . . . The Zillow Group portfolio of consumer

14   brands includes Zillow . . . ."[56] Zillow Group's "technology solutions" and actions

15   related to such technology infringe, direct or control infringement, induce infringement,

16   and/or contribute to the infringement through the website and through the mobile

17   application instrumentalities.

18   183.   Zillow, Inc. owns and operates the Zillow website, including at least

19   www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and the

20   Zillow mobile applications on, for example, the iOS and Android operating systems.

21   Zillow, Inc. provides online real estate listings and related services to consumers and

22   local real estate agents through the website and mobile application instrumentalities.

23   184.   Zillow Group and Zillow, Inc. directly infringe one or more claims of the

24   '389 patent through the Zillow website and the Zillow mobile applications, as described

25   below. Additionally, Zillow Group directs and controls the infringing behavior of its

26   agent, Zillow, Inc., which Zillow Group operates and wholly owns.

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[56] Ex. 4 (Zillow Group 2018 10-K) at 3.

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT   85   Case No. 8:19-CV-01777

1   185.   For example, as shown in Exhibit 59, the Zillow website and Zillow mobile

2   applications infringe at least claim 1 of the '389 patent at least by:

3   a.   selecting one or more objects to be displayed in a plurality of layers;

4   b.   identifying a plurality of non-spatially distinguishable display

5   attributes, wherein one or more of the non-spatially distinguishable display attributes
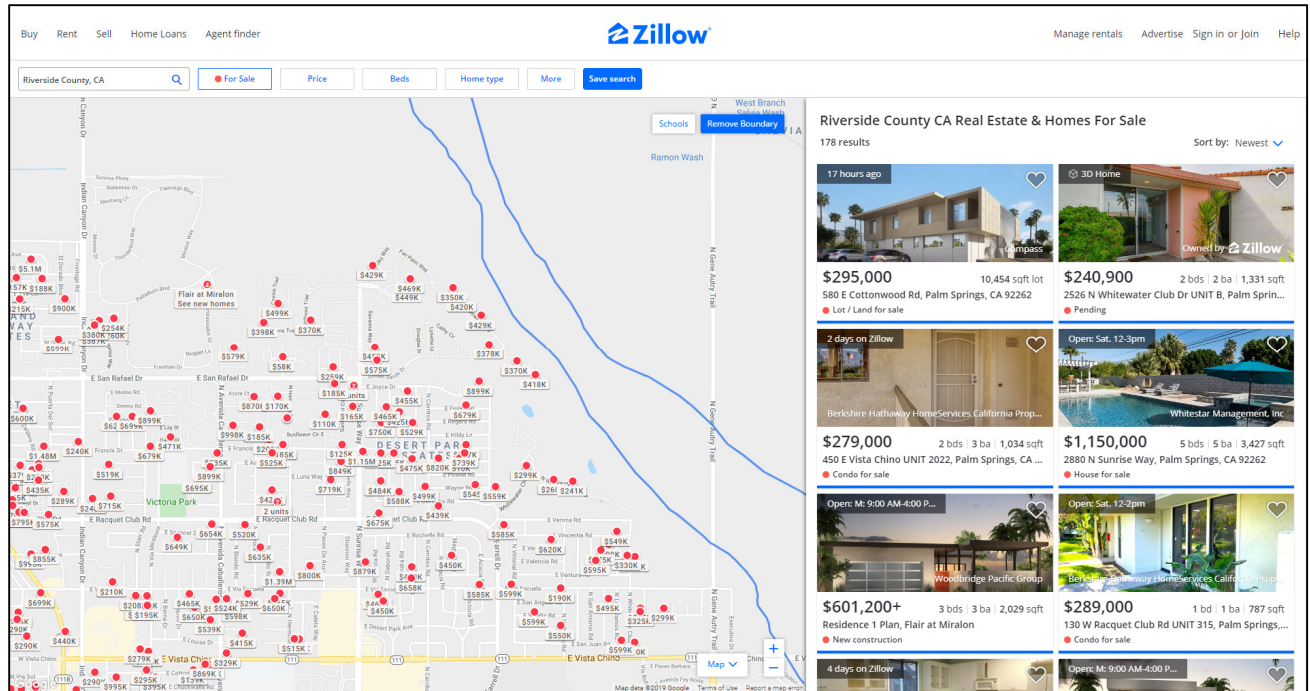
6   corresponds to each of the layers;

7   c.   matching each of the objects to one of the layers;

8   d.   applying the non-spatially distinguishable display attributes

9   corresponding to the layer for each of the matched objects;

10   e.   determining a layer order for the plurality of layers, wherein the

11   layer order determines a display emphasis corresponding to the objects from the

12   plurality of objects in the corresponding layers; and

13   f.   displaying the objects with the applied non-spatially distinguishable

14   display attributes based upon the determination, wherein the objects in a first layer from

15   the plurality of layers are visually distinguished from the objects in the other plurality

16   of layers based upon the non-spatially distinguishable display attributes of the first

17   layer.

18   186.   For another example, Zillow Group and Zillow, Inc. infringe at least claim

19   1 of the '389 patent through Zillow's website and mobile applications in a similar

20   manner to that shown in Ex. 59 at least when the objects are properties from, or

21   involving, Zillow Group Media; when the objects are properties Zillow owns through

22   Zillow Offers; and when the objects are properties, for example, properties from

23   Promoted Communities for new constructions, properties managed by or associated

24   with Premier Agent, and other properties promoted using Zillow's advertising services.

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Ex. 44 (Zillow search in Riverside County, CA).

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Ex. 45 (https://www.zillow.com/resources/new-construction/training/inline-

community-preview/).

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1   187. For another example, Zillow Group and Zillow, Inc. infringe at least claim

2   1 of the '389 patent through the Premier Agent service in at least a similar manner to

3   that shown in Ex. 59:

Ex. 60 (https://www.zillow.com/profile/Charles-Fabbella/).
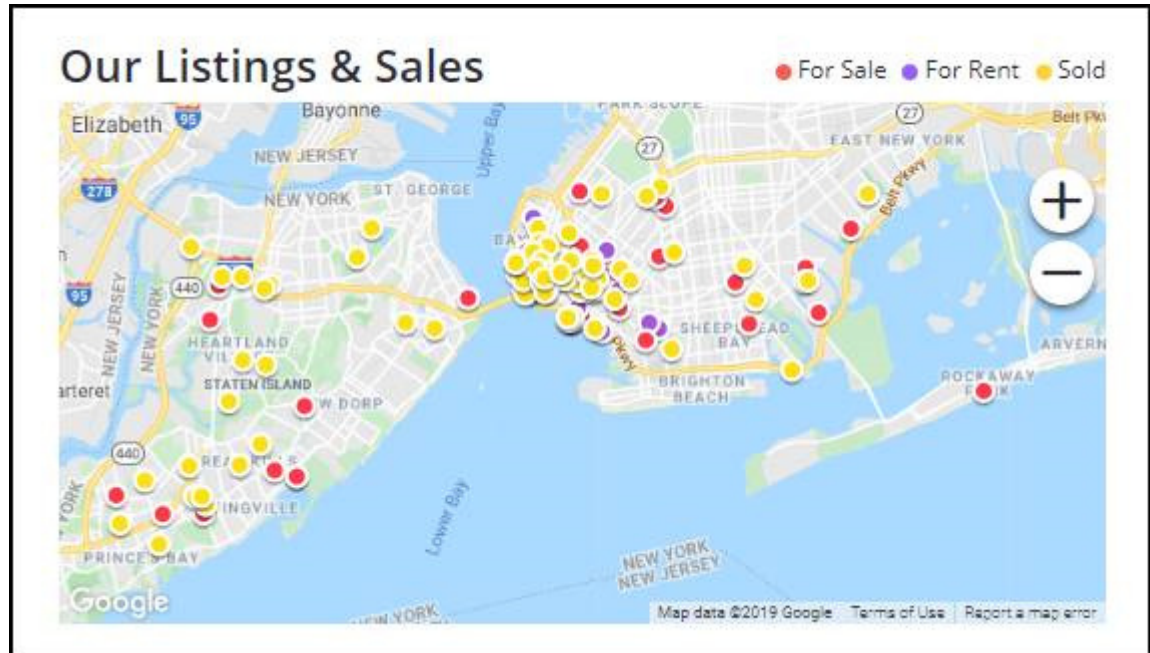
17   188. The Zillow mobile applications, including at least the Zillow Real Estate

18   & Rentals, Zillow Rentals, and Zillow Premier Agent applications, infringe at least

19   claim 1 of the '389 patent in a similar manner as through the website.

20   189. Alternatively, to the extent that any step of claim 1 of the '389 patent,

21   including the "selecting" or "determining" steps, is performed by a third party (in

22   addition to and/or separate from Zillow's performance), such as a user, browser, or

23   mobile operating system, that performance is attributable to Zillow, Inc. and Zillow

24   Group at least because each Zillow entity has an agency and/or contractual relationship

25   with said third party and each Zillow entity controls and/or directs the performance of

26   said third party.   For example, each Zillow entity controls and/or directs the

27   performance of the "selecting" step by users, browsers, and mobile operating systems

28   because it, for example, conditions receipt of a benefit, such as the ability for users to

1 search for and receive property listings on a map on Zillow's website and mobile

2 applications, on the performance of the claimed steps, and establishes the manner or

3 timing of the performance by, for example, determining what type of properties are to

4 be returned in a search. For another example, each Zillow entity controls and/or directs

5 the performance of the "selecting" step by users, browsers, and mobile operating

6 systems because it profits from the performance by, for example, increasing use and

7 user interactions from improved search functionality, and each Zillow entity has the

8 right to stop or limit infringement, by, for example, not sending search results requested

9 by the user in this manner.

10   190.   Alternatively, to the extent any step of claim 1 of the '389 patent, including

11 the "selecting" or "determining" steps, is performed by a third party (in addition to

12 and/or separate from Zillow's performance), such as a Content Delivery Network

13 ("CDN") or other server, including Amazon CloudFront, that performance is

14 attributable to Zillow, Inc. and Zillow Group at least because each Zillow entity has an

15 agency and/or contractual relationship with said third party and each Zillow entity

16 controls and/or directs the performance of said third party. For example, each Zillow

17 entity controls and/or directs the performance of the "selecting" step by CDNs because

18 it, for example, conditions receipt of a benefit, such as payment for services, on the

19 performance of the claimed steps, and establishes the manner or timing of the

20 performance by, for example, determining what type of properties are to be returned in

21 a search.   For another example, each Zillow entity controls and/or directs the

22 performance of the "selecting" step by CDNs because it profits from the performance

23 by, for example, increasing use and user interactions from improved search

24 functionality, and each Zillow entity has the right to stop or limit infringement, by, for

25 example, not sending search results requested by the user in this manner.

26   191.   Zillow Group and Zillow, Inc. have had knowledge of the '389 patent and

27 their alleged direct and indirect infringement since January 14, 2019.

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1   192.   Zillow Group and Zillow, Inc. also indirectly infringe one or more claims

2 of the '389 patent through the Zillow website, including at least www.zillow.com,

3 www.zillowgroupmedia.com, and subdomains thereof, and the Zillow mobile

4 applications. On information and belief, in certain circumstances, client devices and

5 software (e.g., devices and software used by end users and customers of Zillow's

6 website and the associated mobile applications) directly infringe the '389 patent through

7 the use of the website and mobile applications to view at least real estate listings. Zillow

8 Group's Annual Report lists $1,333,554,000 of revenue from its website and mobile

9 applications which "generate revenue from the sale of advertising services and our suite

10 of marketing software and technology solutions."[57]   The revenue indicates that

11 numerous end users and customers used Zillow's website and the associated mobile

12 applications in order to view real estate listings and thereby infringe the '389 patent. In

13 particular, to the extent Zillow does not perform the method steps, in certain

14 circumstances, client devices and software (e.g., devices and software used by end users

15 and customers of Zillow's website and the associated mobile applications) perform at

16 least the method of displaying layered data recited by claim 1 of the '389 patent as

17 shown in Exhibit 59.

18   193.   On information and belief, despite knowledge of the infringement of the

19 '389 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

20 contribute to patent infringement by third parties by selling, offering to sell, and/or

21 supplying components, and/or a material or apparatus for use in practicing the patented

22 methods of the '389 patent by at least end users and consumers, as described in this

23 section.

24   194.   For example Zillow Group and Zillow Inc. provide computer code

25 underlying the Zillow website and mobile applications, such as HTML, JavaScript, and

26 image files, to customers and end users for use in infringing the '389 patent and such

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[57] Ex. 4 (Zillow Group 2018 10-K) at 3, 42.

1   computer code does not have substantial non-infringing uses. Such computer code is

2   especially made and/or especially adapted for use in infringing the '389 patent and is

3   not a staple article or commodity of commerce suitable for substantial non-infringing

4   use. The only substantial use of Zillow's computer code responses is for the claimed

5   subject matter involving displaying layered data as described in the '389 patent.

6   195.   Further, on information and belief, as a part of providing said computer

7   code, Zillow Group and Zillow, Inc. enter into binding contracts with end users and

8   customers to use Zillow's website and mobile applications, including in an infringing

9   manner including by binding the users to a terms of use for the accused website and

10 mobile applications. On information and belief, Zillow Group and Zillow, Inc. receive

11 valuable consideration from customers and end users located in this judicial district,

12 including information provided by customers and end users, and/or information

13 automatically collected from customers and end users. When customers and end users

14 in this judicial district use the accused website and/or mobile applications, Zillow Group

15 and Zillow, Inc. collect information about the customers and end users, their devices,

16 and their interaction with the accused website and the associated mobile applications.

17 Zillow Group and Zillow, Inc. work with service providers and advertising networks to

18 track and manage cookie information and activities of customers and end users across

19 different websites and devices. Third parties use cookie information collected by Zillow

20 Group and Zillow, Inc. to deliver advertisements to end users and customers based on

21 their use of the accused website and mobile applications. Zillow Group and Zillow,

22 Inc.'s business is primarily funded through advertising. The applications and website

23 are especially made and/or especially adapted for use in infringing the Patents-in-Suit,

24 at least as detailed in the individual Counts above, and are not a staple article or

25 commodity of commerce suitable for substantial non-infringing uses because, among

26 other things, the components sent to users are uniquely designed only to access the

27 infringing aspects of Zillow's website and mobile applications.

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1   196.   On information and belief, despite their knowledge of the infringement of

2   the '389 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

3   induce patent infringement by third parties, including at least the direct infringement by

4   end users and customer, as described in this section.   Zillow has and continues to

5   encourage and instruct customers and end users to use Zillow's website and the

6   associated mobile applications in a manner that infringes the '389 patent by advertising

7   the website and mobile applications, providing customer support, and designing their

8   website and mobile applications in such a way that the use of the website and mobile

9   applications by an end user or customer infringes the '389 patent.

10   197.   For example, Zillow has encouraged and continues to encourage and

11 instruct customers and end users to use Zillow's website and the associated mobile

12 applications in an infringing manner by providing customer support from their Irvine

13 office in this district, and designing their website and mobile applications in such a way

14 that the use of the website and mobile applications by an end user or customer infringes

15 the Patents-in-Suit.   For example, "the technology developed in Zillow's Irvine office

16 concerns . . . customer service," including, on information and belief, customer service

17 in support to encourage and support customers and end users in their use of Zillow's

18 website and the associated mobile applications in an infringing manner.[58]   For another

19 example, https://zillow.zendesk.com/hc/en-us provides direction and support for

20 Zillow's website.   On information and belief, to the extent Zillow was not aware that

21 they were encouraging their customers and end users to infringe the '389 patent, its lack

22 of knowledge was based on being willfully blind to the possibility that their acts would

23 cause infringement.

24   198.   IBM has been damaged by the infringement of its '389 patent by Zillow

25 and will continue to be damaged by such infringement.   IBM is entitled to recover from

26 Zillow the damages sustained by IBM as a result of Zillow's wrongful acts.

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[58] Moch Decl. ¶ 11.

1   199.   The infringement by Zillow of the '389 patent was, and continues to be,

2   deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and

3   to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285. In

4   committing these acts of infringement, Zillow actually knew or should have known that

5   its actions constituted an unjustifiably high risk of infringement of a valid and

6   enforceable patent.

7   200.   IBM has suffered and continues to suffer irreparable harm, for which there

8   is no adequate remedy at law, and will continue to do so unless Zillow is enjoined

9   therefrom by this Court. In committing these acts of infringement, Zillow actually knew

10 or should have known that its actions constituted an unjustifiably high risk of

11 infringement of a valid and enforceable patent.

12 ## COUNT SIX

13 ## INFRINGEMENT OF THE '443 PATENT

14 201.   IBM incorporates by reference paragraphs 1-200.

15 202.   IBM is the owner of all right, title and interest in the '443 patent. The '443

16 patent was duly and properly issued by the USPTO on July 11, 2006. The '443 patent

17 was duly assigned to IBM. A copy of the '443 patent is attached hereto as Exhibit 61.

18 203.   The '443 patent is valid and enforceable.

19 204.   In violation of 35 U.S.C. § 271, Zillow has infringed, contributed to the

20 infringement of, and/or induced others to infringe one or more of the claims of the '443

21 patent by having made, designed, offered for sale, sold, provided, used, maintained,

22 and/or   supported   their   website,   including   at   least   www.zillow.com,

23 www.zillowgroupmedia.com, and subdomains thereof, and the associated mobile

24 applications, including the Zillow applications for mobile devices running on, for

25 example, the Apple iOS and Google Android operating systems, including at least

26 Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications.

27 Zillow's infringement is continuing.

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1   205. Zillow Group "operates the largest portfolio of real estate and home-

2 related brands on mobile and the web which focus on all stages of the home lifecycle:

3 renting, buying, selling and financing. . . . The Zillow Group portfolio of consumer

4 brands includes Zillow . . . ."[59] Zillow Group's "technology solutions" and actions

5 related to such technology infringe, direct or control infringement, induce infringement,

6 and/or contribute to the infringement through the website and through the mobile

7 application instrumentalities.

8   206. Zillow, Inc. owns and operates the Zillow website, including at least

9 www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and the

10 Zillow mobile applications on, for example, the iOS and Android operating systems.

11 Zillow, Inc. provides online real estate listings and related services to consumers and

12 local real estate agents through the website and mobile application instrumentalities.

13   207. Zillow Group and Zillow, Inc. directly infringe one or more claims of the

14 '443 patent through the Zillow website and the Zillow mobile applications, as described

15 below. Additionally, Zillow Group directs and controls the infringing behavior of its

16 agent, Zillow, Inc., which Zillow Group operates and wholly owns.

17   208. For example, as shown in Exhibit 62, the Zillow website and Zillow mobile

18 applications infringe at least claim 1 of the '443 patent at least by:

19   a.   identifying at least one search result item from a search result of said

20 Internet search by said user;

21   b.   searching for said at least one associated advertisement within said

22 repository using said at least one search result item;

23   c.   identifying said at least one associated advertisement from said

24 repository having at least one word that matches said at least one search result item; and

25   d.   correlating said at least one associated advertisement with said at

26 least one search result item.

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[59] Ex. 4 (Zillow Group 2018 10-K) at 3.

209.   For another example, Zillow Group and Zillow, Inc. infringe at least claim 1 of the '443 patent through Zillow's website and mobile applications in a similar manner to that shown in Ex. 62 at least when the advertising is from, or involves, Zillow Group Media; when the advertising is for properties Zillow owns through Zillow Offers; and when the advertising is for other advertised properties, such as Promoted Communities for new constructions, properties managed by or associated with Premier Agent, and other properties promoted using Zillow's advertising services.
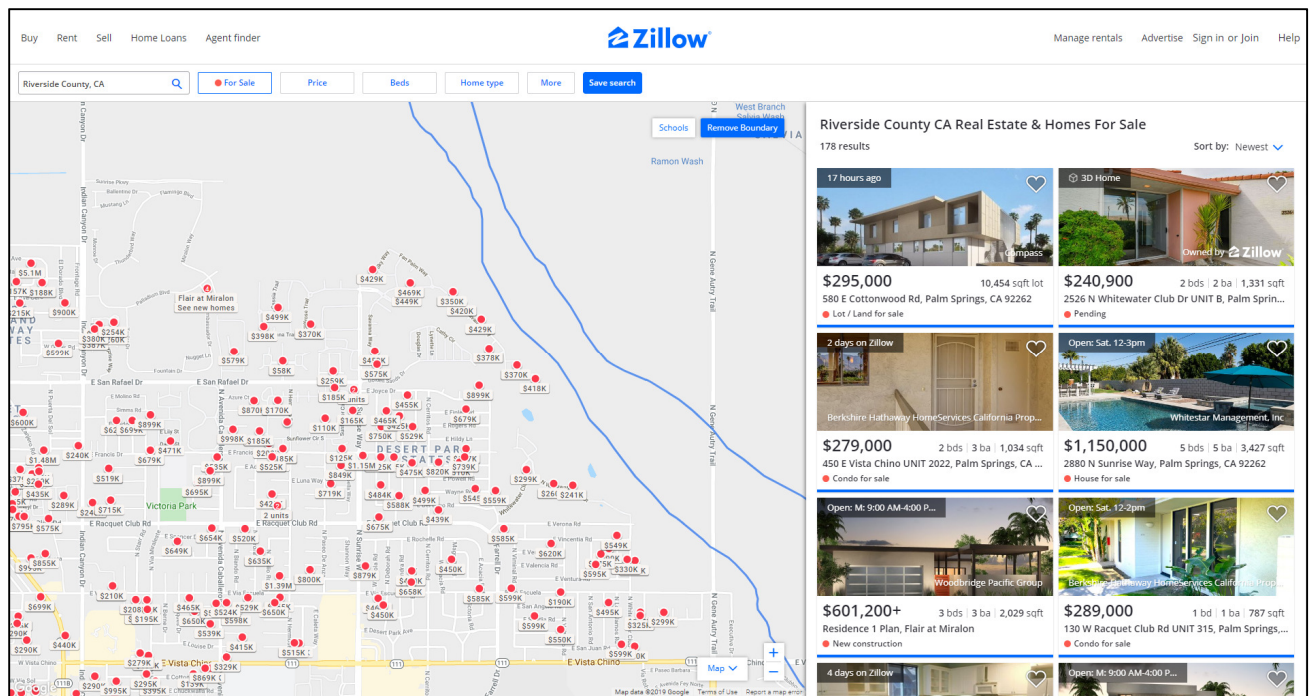
Ex. 44 (Zillow search in Riverside County, CA).

Ex. 45 (https://www.zillow.com/resources/new-construction/training/inline-community-preview/).

210.   The Zillow mobile applications, including at least the Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications, infringe at least claim 1 of the '443 patent in a similar manner as through the website.

211.   Alternatively, to the extent that any step of claim 1 of the '443 patent, including the "identifying" step, is performed by a third party (in addition to and/or separate from Zillow's performance), such as a user, browser, or mobile operating system, that performance is attributable to Zillow, Inc. and Zillow Group at least because each Zillow entity has an agency and/or contractual relationship with said third party and each Zillow entity controls and/or directs the performance of said third party. For example, each Zillow entity controls and/or directs the performance of the "identifying" step by users, browsers, and mobile operating systems because it, for example, conditions receipt of a benefit, such as receiving personalized advertisements, on the performance of the claimed steps, and establishes the manner or timing of the performance by, for example, determining which advertisements are associated with which search result items. For another example, each Zillow entity controls and/or

1   directs the performance of the "identifying" step by users, browsers, and mobile

2   operating systems because it profits from the performance by, for example, increasing

3   use and user interactions from improved targeting of advertisements, and each Zillow

4   entity has the right to stop or limit infringement, by, for example, removing this feature

5   from the Zillow website and applications.

6   212.   Alternatively, to the extent any step of claim 1 of the '443 patent, including

7   the "identifying" step, is performed by a third party (in addition to and/or separate from

8   Zillow's performance), such as a Content Delivery Network ("CDN") or other server,

9   including Amazon CloudFront, that performance is attributable to Zillow, Inc. and

10   Zillow Group at least because each Zillow entity has an agency and/or contractual

11   relationship with said third party and each Zillow entity controls and/or directs the

12   performance of said third party. For example, each Zillow entity controls and/or directs

13   the performance of the "identifying" step by CDNs because it, for example, conditions

14   receipt of a benefit, such as payment for services, on the performance of the claimed

15   steps, and establishes the manner or timing of the performance by, for example,

16   determining which advertisements are associated with which search result items. For

17   another example, each Zillow entity controls and/or directs the performance of the

18   "identifying" step by CDNs because it profits from the performance by, for example,

19   increasing use and user interactions from improved targeting of advertisements, and

20   each Zillow entity has the right to stop or limit infringement, by, for example, removing

21   this feature from the Zillow website and applications.

22   213.   Zillow Group and Zillow, Inc. have had knowledge of the '443 patent and

23   its alleged direct and indirect infringement since August 26, 2019.

24   214.   Zillow Group and Zillow, Inc. also indirectly infringe one or more claims

25   of the '443 patent through the Zillow website, including at least www.zillow.com,

26   www.zillowgroupmedia.com, and subdomains thereof, and the Zillow mobile

27   applications. On information and belief, in certain circumstances, client devices and

28   software (e.g., devices and software used by end users and customers of Zillow's

1   website and the associated mobile applications) directly infringe the '443 patent through

2   the use of the website and mobile applications to view at least real estate listings. Zillow

3   Group's Annual Report lists $1,333,554,000 of revenue from its website and mobile

4   applications which "generate revenue from the sale of advertising services and our suite

5   of marketing software and technology solutions."[60]   The revenue indicates that

6   numerous end users and customers used Zillow's website and the associated mobile

7   applications in order to view real estate listings and thereby infringe the '443 patent. In

8   particular, to the extent Zillow does not perform the method steps, in certain

9   circumstances, client devices and software (e.g., devices and software used by end users

10 and customers of Zillow's website and the associated mobile applications) perform at

11 least the method of targeting associated advertisements recited by claim 1 of the '443

12 patent as shown in Exhibit 62.

13   215.   On information and belief, despite knowledge of the infringement of the

14 '443 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

15 contribute to patent infringement by third parties by selling, offering to sell, and/or

16 supplying components, and/or a material or apparatus for use in practicing the patented

17 methods of the '443 patent by at least end users and consumers, as described in this

18 section.

19   216. For example Zillow Group and Zillow Inc. provide computer code

20 underlying the Zillow website and mobile applications, such as HTML, JavaScript, and

21 image files, to customers and end users for use in infringing the '443 patent and such

22 computer code does not have substantial non-infringing uses. Such computer code is

23 especially made and/or especially adapted for use in infringing the '443 patent and is

24 not a staple article or commodity of commerce suitable for substantial non-infringing

25 use. The only substantial use of Zillow's computer code responses is for the claimed

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[60] Ex. 4 (Zillow Group 2018 10-K) at 3, 42.

1   subject matter involving targeting associated advertisements as described in the '443

2   patent.

3   217.   Further, on information and belief, as a part of providing said computer

4   code, Zillow Group and Zillow, Inc. enter into binding contracts with end users and

5   customers to use Zillow's website and mobile applications, including in an infringing

6   manner including by binding the users to a terms of use for the accused website and

7   mobile applications. On information and belief, Zillow Group and Zillow, Inc. receive

8   valuable consideration from customers and end users located in this judicial district,

9   including information provided by customers and end users, and/or information

10   automatically collected from customers and end users. When customers and end users

11   in this judicial district use the accused website and/or mobile applications, Zillow Group

12   and Zillow, Inc. collect information about the customers and end users, their devices,

13   and their interaction with the accused website and the associated mobile applications.

14   Zillow Group and Zillow, Inc. work with service providers and advertising networks to

15   track and manage cookie information and activities of customers and end users across

16   different websites and devices. Third parties use cookie information collected by Zillow

17   Group and Zillow, Inc. to deliver advertisements to end users and customers based on

18   their use of the accused website and mobile applications. Zillow Group and Zillow,

19   Inc.'s business is primarily funded through advertising. The applications and website

20   are especially made and/or especially adapted for use in infringing the Patents-in-Suit,

21   at least as detailed in the individual Counts above, and are not a staple article or

22   commodity of commerce suitable for substantial non-infringing uses because, among

23   other things, the components sent to users are uniquely designed only to access the

24   infringing aspects of Zillow's website and mobile applications.

25   218.   On information and belief, despite their knowledge of the infringement of

26   the '443 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

27   induce patent infringement by third parties, including at least the direct infringement by

28   end users and customer, as described in this section. Zillow has and continues to

1 encourage and instruct customers and end users to use Zillow's website and the

2 associated mobile applications in a manner that infringes the '443 patent by advertising

3 the website and mobile applications, providing customer support, and designing their

4 website and mobile applications in such a way that the use of the website and mobile

5 applications by an end user or customer infringes the '443 patent.

6   219. For example, Zillow has encouraged and continues to encourage and

7 instruct customers and end users to use Zillow's website and the associated mobile

8 applications in an infringing manner by providing customer support from their Irvine

9 office in this district, and designing their website and mobile applications in such a way

10 that the use of the website and mobile applications by an end user or customer infringes

11 the Patents-in-Suit. For example, "the technology developed in Zillow's Irvine office

12 concerns . . . customer service," including, on information and belief, customer service

13 in support to encourage and support customers and end users in their use of Zillow's

14 website and the associated mobile applications in an infringing manner.[61] For another

15 example, https://zillow.zendesk.com/hc/en-us provides direction and support for

16 Zillow's website. As of November 11, 2019, Zillow continues to instructs its customers

17 and end users to view related listings on the accused website without having to return

18 to the search page or select filters in a way that infringes at least claim 1 of the '443

19 patent.[62] On information and belief, to the extent Zillow was not aware that they were

20 encouraging their customers and end users to infringe the '443 patent, its lack of

21 knowledge was based on being willfully blind to the possibility that their acts would

22 cause infringement.

23   220. IBM has been damaged by the infringement of its '443 patent by Zillow

24 and will continue to be damaged by such infringement. IBM is entitled to recover from

25 Zillow the damages sustained by IBM as a result of Zillow's wrongful acts.

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28 [61] Moch Decl. ¶ 11.

[62] Ex. 63 (https://www.zillow.com/tech/embedding-similar-home-recommendation/).

221.   The infringement by Zillow of the '443 patent was, and continues to be, deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285. In committing these acts of infringement, Zillow actually knew or should have known that its actions constituted an unjustifiably high risk of infringement of a valid and enforceable patent.

222.   IBM has suffered and continues to suffer irreparable harm, for which there is no adequate remedy at law, and will continue to do so unless Zillow is enjoined therefrom by this Court. In committing these acts of infringement, Zillow actually knew or should have known that their actions constituted an unjustifiably high risk of infringement of a valid and enforceable patent.

<div align="center">

COUNT SEVEN

INFRINGEMENT OF THE '904 PATENT

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223.   IBM incorporates by reference paragraphs 1-222.

224.   IBM is the owner of all right, title and interest in the '904 patent. The '904 patent was duly and properly issued by the USPTO on Nov. 20, 2012. The '904 patent was duly assigned to IBM. A copy of the '904 patent is attached hereto as Exhibit 64.

225.   The '904 patent is valid and enforceable.

226.   In violation of 35 U.S.C. § 271, Zillow has infringed, contributed to the infringement of, and/or induced others to infringe one or more of the claims of the '904 patent by having made, designed, offered for sale, sold, provided, used, maintained, and/or supported its website, including at least www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and the associated mobile applications, including the Zillow applications for mobile devices running on, for example, the Apple iOS and Google Android operating systems, including at least Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications. Zillow's infringement is continuing.

1   227. Zillow Group "operates the largest portfolio of real estate and home-

2 related brands on mobile and the web which focus on all stages of the home lifecycle:

3 renting, buying, selling and financing. . . . The Zillow Group portfolio of consumer

4 brands includes Zillow . . . ."[63] Zillow Group's "technology solutions" and actions

5 related to such technology infringe, direct or control infringement, induce infringement,

6 and/or contribute to the infringement through the website and through the mobile

7 application instrumentalities.

8   228. Zillow, Inc. owns and operates the Zillow website, including at least

9 www.zillow.com, www.zillowgroupmedia.com, and subdomains thereof, and the

10 Zillow mobile applications on, for example, the iOS and Android operating systems.

11 Zillow, Inc. provides online real estate listings and related services to consumers and

12 local real estate agents through the website and mobile application instrumentalities.

13   229. Zillow Group and Zillow, Inc. directly infringe one or more claims of the

14 '904 patent through the Zillow website and the Zillow mobile applications, as described

15 below. Additionally, Zillow Group directs and controls the infringing behavior of its

16 agent, Zillow, Inc., which Zillow Group operates and wholly owns.

17   230. For example, as shown in Exhibit 65, the Zillow website and Zillow mobile

18 applications infringe at least claim 1 of the '904 patent at least by:

19   a.   producing, by one or more computers, a promotion list for a

20 promotion management campaign by:

21   b.   generating, by one or more computers, a promotion instance from a
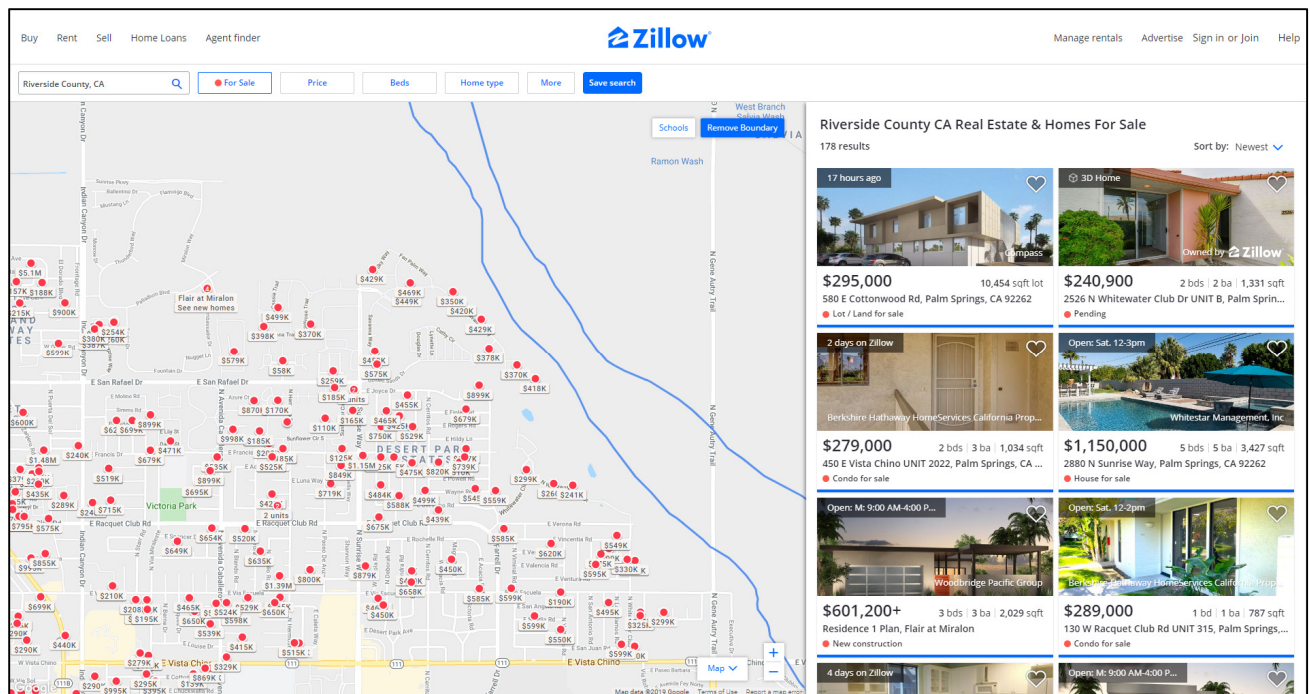
22 promotion template;

23   c.   receiving, by one or more computers executing marketing campaign

24 software, a search query that includes one or more attributes of a promotion instance;

25   d.   searching one or more data repositories for promotion instances

26 having attributes corresponding to the attributes specified in the search query;

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_____

[63] Ex. 4 (Zillow Group 2018 10-K) at 3.

1   e.   returning a list including one or more promotion instances having

2   the attributes corresponding to the attributes specified in the search query;

3   f.   receiving, by the one or more computers, a selection of one or more

4   promotion instances, from the returned list, to be included in the promotion list;

5   g.   assigning the selected promotion instances to the promotions list;

6   and

7   h.   storing the promotion list in an electronic medium.

8   231.   For another example, Zillow Group and Zillow, Inc. infringe at least claim

9   1 of the '904 patent through Zillow's website and mobile applications in a similar

10   manner to that shown in Ex. 65 at least when the advertising is from, or involves, Zillow

11   Group Media; when the advertising is for properties Zillow owns through Zillow Offers;

12   and when the advertising is for other advertised properties, such as Promoted

13   Communities for new constructions, properties managed by or associated with Premier

14   Agent, and other properties promoted using Zillow's advertising services.

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27   Ex. 44 (Zillow search in Riverside County, CA).

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Ex. 45 (https://www.zillow.com/resources/new-construction/training/inline-community-preview/).

Ex. 46 (https://www.zillow.com/marketing/rental-property-advertising/).

232.   For another example, Zillow Group and Zillow, Inc. infringe at least claim 1 of the '904 patent through the Zillow Group Media service in at least a similar manner to that shown in Ex. 65:

Ex. 66 (https://www.zillowgroupmedia.com/wp-content/uploads/2019/10/Zillow-

Group-Native-Search-Ad.pdf).

233.   For another example, Zillow Group and Zillow, Inc. infringe at least claim 1 of the '904 patent through the Zillow Group Media service in at least a similar manner to that shown in Ex. 65:

Ad Products

Reach coveted audiences by featuring your brand in native placements across Zillow Group brands and devices. Integrate your message into the user experience with ad products that are perfectly formatted for every device to achieve outstanding performance results.

Ex. 47 (https://www.zillowgroupmedia.com/native-ads/).

234.   The Zillow mobile applications, including at least the Zillow Real Estate & Rentals, Zillow Rentals, and Zillow Premier Agent applications, infringe at least claim 1 of the '904 patent in a similar manner as through the website.

235.   Alternatively, to the extent that any step of claim 1 of the '904 patent, including the "receiving" step, is performed by a third party (in addition to and/or separate from Zillow's performance), such as a user, browser, or mobile operating system, that performance is attributable to Zillow, Inc. and Zillow Group at least because each Zillow entity has an agency and/or contractual relationship with said third party and each Zillow entity controls and/or directs the performance of said third party. For example, each Zillow entity controls and/or directs the performance of the "receiving" step by users, browsers, and mobile operating systems because it, for example, conditions receipt of a benefit, such as improved quality of search results, on the performance of the claimed steps, and establishes the manner or timing of the performance by, for example, determining which search results will be returned to the user. For another example, each Zillow entity controls and/or directs the performance of the "receiving" step by users, browsers, and mobile operating systems because it profits from the performance by, for example, increasing use and user interactions from improved search results, and each Zillow entity has the right to stop or limit infringement, by, for example, using a different method to return search results to a user.

1   236.   Alternatively, to the extent any step of claim 1 of the '904 patent, including

2 the "receiving" step, is performed by a third party (in addition to and/or separate from

3 Zillow's performance), such as a Content Delivery Network ("CDN") or other server,

4 including Amazon CloudFront, that performance is attributable to Zillow, Inc. and

5 Zillow Group at least because each Zillow entity has an agency and/or contractual

6 relationship with said third party and each Zillow entity controls and/or directs the

7 performance of said third party. For example, each Zillow entity controls and/or directs

8 the performance of the "receiving" step by CDNs because it, for example, conditions

9 receipt of a benefit, such as payment for services, on the performance of the claimed

10 steps, and establishes the manner or timing of the performance by, for example,

11 determining which search results will be returned to the user. For another example,

12 each Zillow entity controls and/or directs the performance of the "receiving" step by

13 CDNs because it profits from the performance by, for example, increasing use and user

14 interactions from improved search results, and each Zillow entity has the right to stop

15 or limit infringement, by, for example, using a different method to return search results

16 to a user.

17   237.   Zillow Group and Zillow, Inc. have had knowledge of the '904 patent and

18 its alleged direct and indirect infringement since August 26, 2019.

19   238.   Zillow Group and Zillow, Inc. also indirectly infringe one or more claims

20 of the '904 patent through the Zillow website, including at least www.zillow.com,

21 www.zillowgroupmedia.com, and subdomains thereof, and the Zillow mobile

22 applications. On information and belief, in certain circumstances, client devices and

23 software (e.g., devices and software used by end users and customers of Zillow's

24 website and the associated mobile applications) directly infringe the '904 patent through

25 the use of the website and mobile applications to view at least real estate listings. Zillow

26 Group's Annual Report lists $1,333,554,000 of revenue from its website and mobile

27 applications which "generate revenue from the sale of advertising services and our suite

28

1   of marketing software and technology solutions."[64]   The revenue indicates that

2   numerous end users and customers used Zillow's website and the associated mobile

3   applications in order to view real estate listings and thereby infringe the '904 patent. In

4   particular, to the extent Zillow does not perform the method steps, in certain

5   circumstances, client devices and software (e.g., devices and software used by end users

6   and customers of Zillow's website and the associated mobile applications) perform at

7   least the method of producing a promotion list recited by claim 1 of the '904 patent as

8   shown in Exhibit 65.

9   239. On information and belief, despite knowledge of the infringement of the

10   '904 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

11   contribute to patent infringement by third parties by selling, offering to sell, and/or

12   supplying components, and/or a material or apparatus for use in practicing the patented

13   methods of the '904 patent by at least end users and consumers, as described in this

14   section.

15   240. For example Zillow Group and Zillow Inc. provide computer code

16   underlying the Zillow website and mobile applications, such as HTML, JavaScript, and

17   image files, to customers and end users for use in infringing the '904 patent and such

18   computer code does not have substantial non-infringing uses. Such computer code is

19   especially made and/or especially adapted for use in infringing the '904 patent and is

20   not a staple article or commodity of commerce suitable for substantial non-infringing

21   use. The only substantial use of Zillow's computer code responses is for the claimed

22   subject matter involving returning a promotion list as described in the '904 patent.

23   241. Further, on information and belief, as a part of providing said computer

24   code, Zillow Group and Zillow, Inc. enter into binding contracts with end users and

25   customers to use Zillow's website and mobile applications, including in an infringing

26   manner including by binding the users to a terms of use for the accused website and

27

28
_____

[64] Ex. 4 (Zillow Group 2018 10-K) at 3, 42.

1   mobile applications. On information and belief, Zillow Group and Zillow, Inc. receive

2   valuable consideration from customers and end users located in this judicial district,

3   including information provided by customers and end users, and/or information

4   automatically collected from customers and end users. When customers and end users

5   in this judicial district use the accused website and/or mobile applications, Zillow Group

6   and Zillow, Inc. collect information about the customers and end users, their devices,

7   and their interaction with the accused website and the associated mobile applications.

8   Zillow Group and Zillow, Inc. work with service providers and advertising networks to

9   track and manage cookie information and activities of customers and end users across

10 different websites and devices. Third parties use cookie information collected by Zillow

11 Group and Zillow, Inc. to deliver advertisements to end users and customers based on

12 their use of the accused website and mobile applications. Zillow Group and Zillow,

13 Inc.'s business is primarily funded through advertising. The applications and website

14 are especially made and/or especially adapted for use in infringing the Patents-in-Suit,

15 at least as detailed in the individual Counts above, and are not a staple article or

16 commodity of commerce suitable for substantial non-infringing uses because, among

17 other things, the components sent to users are uniquely designed only to access the

18 infringing aspects of Zillow's website and mobile applications.

19   242.   On information and belief, despite their knowledge of the infringement of

20 the '904 patent, Zillow Group and Zillow, Inc. have intended and continue to intend to

21 induce patent infringement by third parties, including at least the direct infringement by

22 end users and customer, as described in this section. Zillow has and continues to

23 encourage and instruct customers and end users to use Zillow's website and the

24 associated mobile applications in a manner that infringes the '904 patent by advertising

25 the website and mobile applications, providing customer support, and designing their

26 website and mobile applications in such a way that the use of the website and mobile

27 applications by an end user or customer infringes the '904 patent.

28

243.   For example, Zillow has encouraged and continues to encourage and instruct customers and end users to use Zillow's website and the associated mobile applications in an infringing manner by providing customer support from their Irvine office in this district, and designing their website and mobile applications in such a way that the use of the website and mobile applications by an end user or customer infringes the Patents-in-Suit. For example, "the technology developed in Zillow's Irvine office concerns . . . customer service," including, on information and belief, customer service in support to encourage and support customers and end users in their use of Zillow's website and the associated mobile applications in an infringing manner.[65] For another example, https://zillow.zendesk.com/hc/en-us provides direction and support for Zillow's website. On information and belief, to the extent Zillow was not aware that they were encouraging their customers and end users to infringe the '904 patent, its lack of knowledge was based on being willfully blind to the possibility that their acts would cause infringement.

244.   IBM has been damaged by the infringement of its '904 patent by Zillow and will continue to be damaged by such infringement. IBM is entitled to recover from Zillow the damages sustained by IBM as a result of Zillow's wrongful acts.

245.   The infringement by Zillow of the '904 patent was, and continues to be, deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285. In committing these acts of infringement, Zillow actually knew or should have known that its actions constituted an unjustifiably high risk of infringement of a valid and enforceable patent.

246.   IBM has suffered and continues to suffer irreparable harm, for which there is no adequate remedy at law, and will continue to do so unless Zillow is enjoined therefrom by this Court. In committing these acts of infringement, Zillow actually knew

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[65] Moch Decl. ¶ 11.

1   or should have known that their actions constituted an unjustifiably high risk of

2   infringement of a valid and enforceable patent.

3   **RELIEF REQUESTED**

4   Wherefore, IBM respectfully requests that this Court enter judgment against the

5   Defendants as follows:

6   A.   That the '849 patent has been and continues to be infringed by Defendants;

7   B.   That Defendants' infringement of the '849 patent has been willful;

8   C.   An injunction against further infringement of the '849 patent;

9   D.   That the '346 patent has been and continues to be infringed by Defendants;

10   E.   That Defendants' infringement of the '346 patent has been willful;

11   F.   An injunction against further infringement of the '346 patent;

12   G.   That the '183 patent has been and continues to be infringed by Defendants;

13   H.   That Defendants' infringement of the '183 patent has been willful;

14   I.   An injunction against further infringement of the '183 patent;

15   J.   That the '789 patent has been and continues to be infringed by Defendants;

16   K.   That Defendants' infringement of the '789 patent has been willful;

17   L.   An injunction against further infringement of the '789 patent;

18   M.   That the '389 patent has been and continues to be infringed by Defendants;

19   N.   That Defendants' infringement of the '389 patent has been willful;

20   O.   An injunction against further infringement of the '389 patent;

21   P.   That the '443 patent has been and continues to be infringed by Defendants;

22   Q.   That Defendants' infringement of the '443 patent has been willful;

23   R.   An injunction against further infringement of the '443 patent;

24   S.   That the '904 patent has been and continues to be infringed by Defendants;

25   T.   That Defendants' infringement of the '904 patent has been willful;

26   U.   An injunction against further infringement of the '904 patent;

27   V.   An award of damages adequate to compensate IBM for the patent

28 infringement that has occurred pre-verdict and for damages that occur post-verdict,

1 together with pre-judgment interest and costs;

2   W.   An award of all other damages permitted by 35 U.S.C. § 284, including

3 increased damages up to three times the amount of compensatory damages found;

4   X.   That this is an exceptional case and an award to IBM of its costs and

5 reasonable attorneys' fees incurred in this action as provided by 35 U.S.C. § 285; and

6   **Y.**   Such other relief as this Court deems just and proper.

7 Dated: December 2, 2019   By: __/Marc E. Hankin/_____

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16

17

18 **DEMAND FOR JURY TRIAL**

19   IBM hereby demands trial by jury on all claims and issues so triable.

20 Dated: December 2, 2019   By: __/Marc E. Hankin/_____

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